

PSS-51

Owner's Manual

SPECIAL MESSAGE SECTION

This product utilizes batteries or an external power supply (adapter). DO NOT connect this product to any power supply or adapter other than one described in the manual, on the name plate, or specifically recommended by Yamaha.

This product should be used only with the components supplied or; a cart, rack, or stand that is recommended by Yamaha. If a cart, etc., is used, please observe all safety markings and instructions that accompany the accessory product.

SPECIFICATIONS SUBJECT TO CHANGE:

The information contained in this manual is believed to be correct at the time of printing. However, Yamaha reserves the right to change or modify any of the specifications without notice or obligation to update existing units.

This product, either alone or in combination with an amplifier and headphones or speaker/s, may be capable of producing sound levels that could cause permanent hearing loss. DO NOT operate for long periods of time at a high volume level or at a level that is uncomfortable. If you experience any hearing loss or ringing in the ears, you should consult an audiologist. IMPORTANT: The louder the sound, the shorter the time period before damage occurs.

NOTICE:

Service charges incurred due to lack of knowledge relating to how a function or effect works (when the unit is operating as designed) are not covered by the manufacturer's warranty, and are therefore the owners responsibility. Please study this manual carefully and consult your dealer before requesting service.

ENVIRONMENTAL ISSUES:

Yamaha strives to produce products that are both user safe and environmentally friendly. We sincerely believe that our products and the production methods used to produce them, meet these goals. In keeping with both the letter and the spirit of the law, we want you to be aware of the following:

Battery Notice:

This product MAY contain a small non-rechargeable battery which (if applicable) is soldered in place. The average life span of this type

of battery is approximately five years. When replacement becomes necessary, contact a qualified service representative to perform the replacement.

This product may also use "household" type batteries. Some of these may be rechargeable. Make sure that the battery being charged is a rechargeable type and that the charger is intended for the battery being charged.

When installing batteries, do not mix old batteries with new, or with batteries of a different type. Batteries MUST be installed correctly. Mismatches or incorrect installation may result in overheating and battery case rupture.

Warning:

Do not attempt to disassemble, or incinerate any battery. Keep all batteries away from children. Dispose of used batteries promptly and as regulated by the laws in your area. Note: Check with any retailer of household type batteries in your area for battery disposal information.

Disposal Notice:

Should this product become damaged beyond repair, or for some reason its useful life is considered to be at an end, please observe all local, state, and federal regulations that relate to the disposal of products that contain lead, batteries, plastics, etc. If your dealer is unable to assist you, please contact Yamaha directly.

NAME PLATE LOCATION:

The name plate is located on the bottom of the product. The model number, serial number, power requirements, etc., are located on this plate. You should record the model number, serial number, and the date of purchase in the spaces provided below and retain this manual as a permanent record of your purchase.

Model _____

Serial No. _____

Purchase Date _____

PLEASE KEEP THIS MANUAL

FCC INFORMATION

IMPORTANT NOTICE: DO NOT MODIFY THIS UNIT!

This product, when installed as indicated in the instructions contained in this manual, meets FCC requirements. Modifications not expressly approved by Yamaha may void your authority, granted by the FCC, to use the product.

IMPORTANT:

When connecting this product to accessories and/or another product use only high quality shielded cables. Cable/s supplied with this product MUST be used. Follow all installation instructions. Failure to follow instructions could void your FCC authorization to use this product in the USA.

NOTE:

This product has been tested and found to comply with the requirements listed in FCC Regulations, Part 15 for Class "B" digital devices. Compliance with these requirements provides a reasonable level of assurance that your use of this product in a residential environment will not result in harmful interference with other electronic devices. This equipment generates/uses radio frequencies and, if not installed and used according to the instructions found in the user's manual, may cause interference harmful to the operation of other electronic devices.

Compliance with FCC regulations does not guarantee that interference will not occur in all installations. If this product is found to be the source of interference, which can be determined by turning the unit "OFF" and "ON", please try to eliminate the problem by using one of the following measures:

- Relocate either this product or the device that is being affected by the interference.
- Utilize power outlets that are on different branch (circuit breaker or fuse) circuits or install AC line filter/s.
- In the case of radio or TV interference, relocate/reorient the antenna. If the antenna lead-in is 300 ohm ribbon lead, change the lead-in to co-axial type cable.

If these corrective measures do not produce satisfactory results, please contact the local retailer authorized to distribute this type of product. If you can not locate the appropriate, please contact Yamaha Corporation of America, Electronic Service Division, 6600 Orangethorpe Ave, Buena Park CA, 90620



This recycle mark indicates that the packaging conforms to the environmental protection legislation in Germany.

CONGRATULATIONS!

You are the new owner of a state-of-the-art Yamaha PortaSound PSS-51. The fully digital PSS-51 is a high-quality musical instrument that enables you to create a wide variety of sound and music.

In order to maximize your enjoyment and to fully benefit from the performance of the Yamaha PortaSound PSS-51, we strongly recommend you read this Owner's Manual thoroughly while exploring the various features described. Please keep this manual in a safe place for future reference.

SPECIAL FEATURES

- * Advanced Wave Memory (AWM) tone generation technology provides accurate digital control for a broad range of natural and expressive sound qualities.
- * 100 preset AWM Voices and 80 rhythm styles can be easily incorporated for versatile and creative musical performances with a 28 note polyphony.
- * Auto Accompaniment automatically generates completely orchestrated accompaniments to add professional sound to your performances.
- * The PSS-51 is equipped with a sophisticated REGISTRATION MEMORY feature that allows you to instantly set voice effects. The registrations have been created by professional musicians to appropriately match any style of music you wish to play. You can also create and memorize your own original voice effects.
- * 4 Sound Effect Pads generate 9 preset and 1 custom sound effect combinations.
- * 8 Percussion Pads can be played when desired from any one of 9 preset and 1 custom percussion categories.
- * Vector Synth functionality offers unique sound creation opportunities through the use of a joystick to mix any 4 voices simultaneously.
- * The Wheel function enables the pitch, modulation, tempo, or tempo & pitch of any keyboard sound to be inflected up or down as you play.
- * Song Memory (with Multi-Track Sequencer) functionality enables digital recording on 8 separate tracks and memorization of up to 8 songs.
- * Built-in Hi-Fi stereo speakers with Ported Bass Boost offer high quality sound reproduction.
- * The PSS-51 also comes equipped with MIDI (Musical Instrument Digital Interface). MIDI compatibility extends the versatility of the PSS-51 and broadens your musical possibilities.

GETTING STARTED

PRECAUTIONS

1. AVOID EXCESSIVE HEAT, HUMIDITY, DUST, AND VIBRATION

Keep the unit away from locations where it is likely to be exposed to high temperatures or humidity. Also, avoid areas subject to excessive dust accumulation or vibration as these could cause mechanical damage.

2. ELECTRICAL INTERFERENCE

The PSS-51 contains digital circuitry that may cause electrical interference if placed too close to television sets, radios, or similar equipment. Keep affected equipment a reasonable distance away from the PSS-51.

3. AVOID PHYSICAL SHOCKS

Strong physical shocks to the unit can cause damage. Handle with care.

4. TAKE CARE WHEN CONNECTING AND DISCONNECTING CABLES

Always turn the power switch OFF prior to connecting and disconnecting cables. Connect all cables, including the AC cord, by gripping the connector, not the cable. As well, unplug the unit if it is not to be used over a long period of time.

5. DO NOT OPEN THE CASE OR ATTEMPT REPAIRS OR MODIFICATIONS

The PSS-51 does not contain any user-serviceable parts. Refer all maintenance to qualified Yamaha service personnel only. Opening the case or tampering with the internal circuitry will void the warranty.

6. CLEAN WITH A SOFT DRY CLOTH

Never use solvents such as benzene or thinner to clean the unit. Wipe clean with a soft, dry cloth.

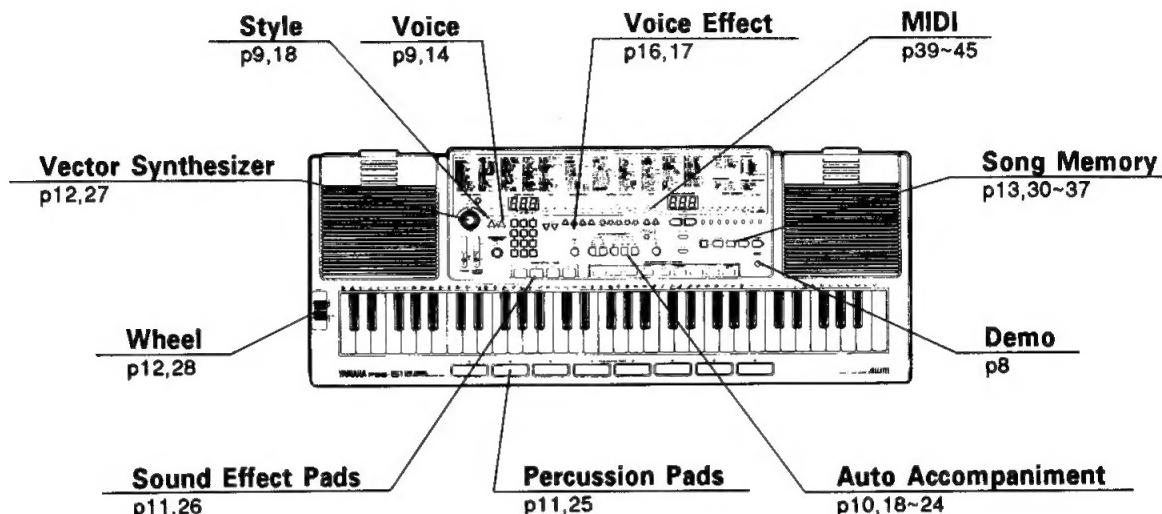
7. MEMORY RETENTION

Memory backup for the PSS-51 is supplied by AC power and batteries. Memory will not be lost when the unit is turned OFF as long as the power cord is connected or there is enough battery power. If the power cord is unplugged and there is no battery power, all data in memory will be lost. Make sure there is adequate power supply present, especially when using the SONG MEMORY and REGISTRATION MEMORY functions.

Yamaha is not responsible for damage caused by improper usage.

CONTENTS

The following diagram provides a simple overview of the PSS-51. Detailed explanations of the eleven main functional areas can be quickly located by referring to the page numbers shown in the diagram below:



GETTING STARTED

PRECAUTIONS	1
CONTENTS.....	2
PREPARATION	
POWER SUPPLY	4
CONNECTING HEADPHONES AND AUXILIARY EQUIPMENT	5
PANEL DESCRIPTION	
FRONT PANEL	6
REAR PANEL.....	7

1. TUTORIALS

Turn The Power On/Set The Master Volume	8
Play A Demo	8
Select And Play Voices	9
Select And Play Rhythm Styles	9
Play With Auto Accompaniment.....	10
Strike Percussion Pads	11
Press Sound Effect Pads	11
Rotate The Wheel	12
Move The Vector Synth Joystick	12
Record With Auto Accompaniment	13

2. OPERATION GUIDE

2.1 SETTING THE VOICE

VOICE	14
-------------	----

2.2 SETTING THE VOICE EFFECTS	
VOLUME	16
HARMONY	16
SUSTAIN	17
REVERB	17
2.3 AUTO ACCOMPANIMENT	
STYLE	18
TEMPO	19
ACCOMP. VOL	19
FINGERING	20
Single Finger	20
Fingered	21
ORCHESTRATION	22
ACCOMPANIMENT CONTROL	22
REGISTRATION MEMORY	24
2.4 SOUND ENRICHMENT	
PERCUSSION PADS	25
SOUND EFFECT PADS	26
VECTOR SYNTH	27
WHEEL	28
2.5 SONG MEMORY	
RECORDING TRACKS	30
RECORDING	30
SONG PLAYBACK	33
SONG EDITING	33
EXAMPLE: SONG MEMORY (MULTI-TRACK RECORDING)	35
2.6 SETTING OTHER FUNCTIONS	
TRANSPOSE	38
TUNING	38
3. MIDI	
WHAT IS MIDI?	39
PSS-51 MIDI OPERATION	41
MIDI - TRANSMIT AND RECEIVE DATA FOR THE PSS-51	43
APPENDICES	
VOICE/POLYPHONY LIST	46
SPECIFICATIONS	46
TROUBLESHOOTING	47
INDEX	48
MIDI Implementation Chart	49

PREPARATION

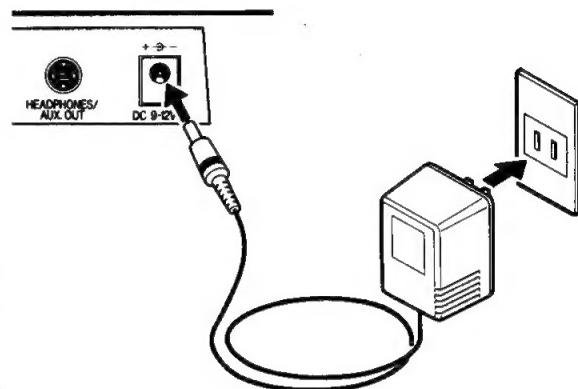
■ POWER SUPPLY

Your PortaSound PSS-51 can be operated with any of the optional Yamaha PA-3, PA-4, or PA-40 AC Power Adaptors or with batteries (sold separately). Follow the instructions below according to the power source to be used.

Using the Optional AC Power Adaptor

Plug the DC output cable from any of the optional Yamaha AC Power Adaptors listed above into the DC 9-12V IN jack on the rear panel of the PSS-51. Then, plug the AC cable of the power adaptor into a convenient AC power wall socket. The internal batteries, if present, are automatically disconnected when the AC adaptor is used.

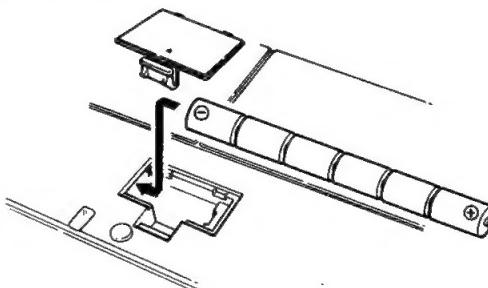
- * ONLY use Yamaha PA-3, PA-4, or PA-40 AC Adaptors to power the PSS-51. Incompatible adaptors may cause irreparable damage to the unit, and may pose a serious shock hazard!



Using Batteries (sold separately)

The PSS-51 uses six 1.5V SUM-2, "C" size, R-14 or equivalent batteries. When the batteries' voltage is low and no longer is able to operate the PSS-51, "b a t" will appear on the MULTI DISPLAY. Replace the batteries with a complete set of six new batteries. NEVER mix the old batteries with the new.

Install new batteries as follows:



1. Turn the power switch OFF.
2. Open the battery compartment cover located on the bottom panel of the instrument by pressing the cover's tab toward the direction of the arrow and pulling up.
3. Remove the old batteries and dispose of them in an environmentally safe manner.
4. Insert the six new batteries carefully following the polarity markings on the inside of the battery compartment.
5. Replace the compartment cover, making sure that it locks firmly in place.

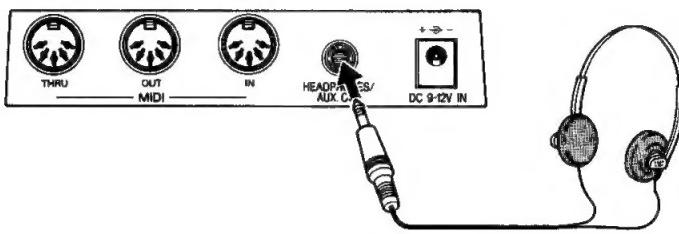
Caution:

To prevent possible damage due to battery leakage, remove the batteries from the instrument if it is not to be used over a long period of time.

■ CONNECTING HEADPHONES AND AUXILIARY EQUIPMENT

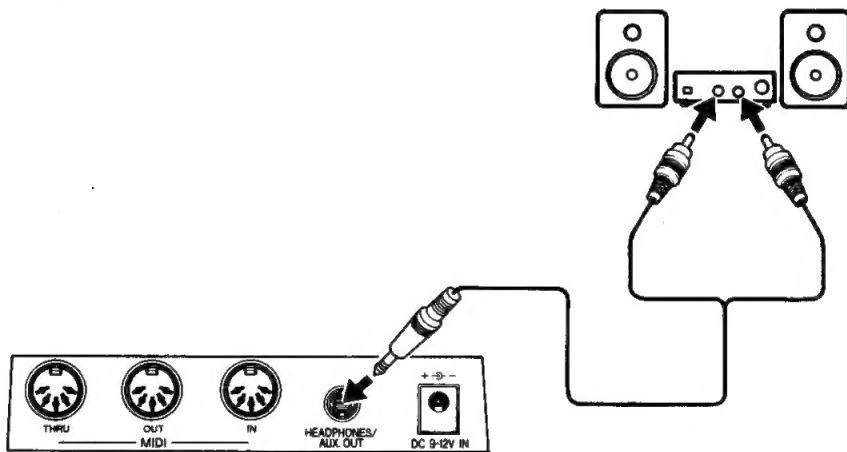
Headphones:

Standard stereo headphones can be connected to the rear-panel HEADPHONES/AUX. OUT jack. The internal speaker system will automatically shut off when the connection is made. This is especially convenient for private practice or playing late at night.



Auxiliary Equipment:

The HEADPHONES/AUX. OUT jack can also be connected to a keyboard amplifier, stereo sound system, mixing console, or tape recorder.

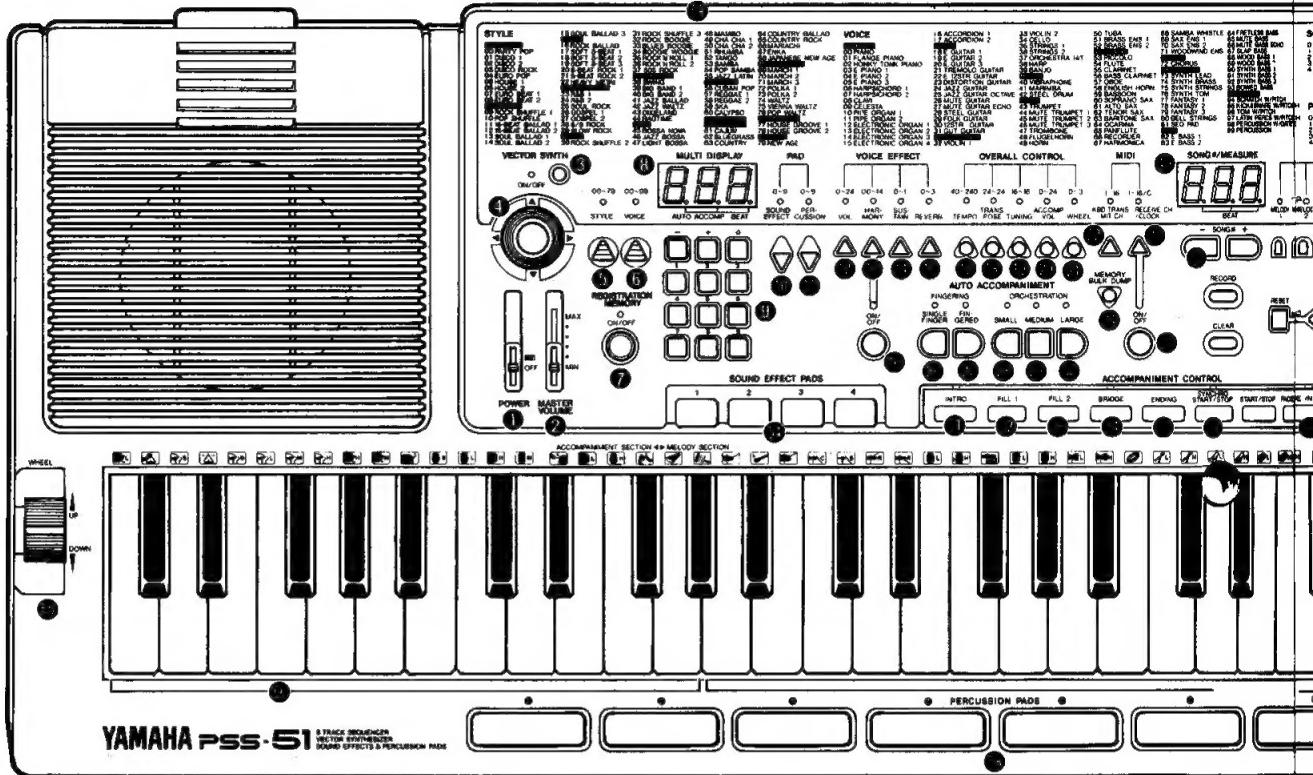


Caution:

To prevent any possible damage to speakers, be sure that the volume controls for the PSS-51 and ALL auxiliary equipment are turned down before making connections.

PANEL DESCRIPTION

■ FRONT PANEL



SETUP

- | | |
|-----------------------------------|--------|
| (1) [POWER] Switch | page 8 |
| (2) [MASTER VOLUME] Control | 8 |

VECTOR SYNTHESIZER

- | | |
|--|----|
| (3) [VECTOR SYNTH ON/OFF] Button | 27 |
| (4) [VECTOR SYNTH] Joystick | 27 |

STYLE/VOICE

- | | |
|--------------------------|----|
| (5) [STYLE] Button | 18 |
| (6) [VOICE] Button | 14 |

REGISTRATION MEMORY

- | | |
|---|----|
| (7) [REGISTRATION MEMORY ON/OFF] Button | 24 |
|---|----|

MULTI DISPLAY

- | | |
|---------------------------|----|
| (8) [MULTI DISPLAY] | 14 |
|---------------------------|----|

NUMERIC KEYPAD

- | | |
|-------------------------------------|----|
| (9) [+], [-], [0]~[9] Buttons | 14 |
|-------------------------------------|----|

PAD

- | | |
|----------------------------------|----|
| (10) [SOUND EFFECT] Button | 26 |
| (11) [PERCUSSION] Button | 25 |

VOICE EFFECT

- | | |
|------------------------------------|----|
| (12) [VOL.] Button | 16 |
| (13) [HARMONY] Button | 16 |
| (14) [SUSTAIN] Button | 17 |
| (15) [REVERB] Button | 17 |
| (16) [HARMONY ON/OFF] Button | 16 |

OVERALL CONTROL

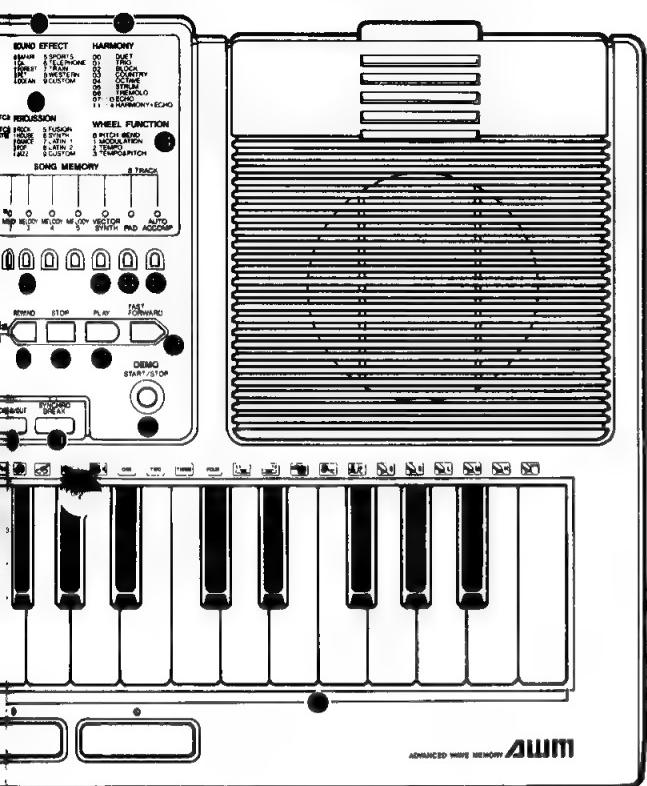
- | | |
|----------------------------------|----|
| (17) [TEMPO] Button | 19 |
| (18) [TRANSPOSE] Button | 38 |
| (19) [TUNING] Button | 38 |
| (20) [ACCOMP. VOL.] Button | 19 |
| (21) [WHEEL] Button | 28 |

MIDI

- | | |
|---|----|
| (22) [KBD TRANSMIT CH] Button | 41 |
| (23) [RECEIVE CH/CLOCK] Button | 41 |
| (24) [MEMORY BULK DUMP] Button | 42 |
| (25) [RECEIVE CH/CLOCK ON/OFF] Button | 41 |

AUTO ACCOMPANIMENT

- ◆ FINGERING
- | | |
|-----------------------------------|----|
| (26) [SINGLE FINGER] Button | 20 |
| (27) [FINGERED] Button | 21 |



◆ ORCHESTRATION	page
(28) [SMALL] Button	22
(29) [MEDIUM] Button	22
(30) [LARGE] Button	22

ACCOMPANIMENT CONTROL

(31) [INTRO] Button	22
(32) [FILL 1] Button	23
(33) [FILL 2] Button	23
(34) [BRIDGE] Button	23
(35) [ENDING] Button	23
(36) [SYNCHRO START/STOP] Button	23
(37) [START/STOP] Button	23
(38) [FADE IN/OUT] Button	24
(39) [SYNCHRO BREAK] Button	24

SONG#/MEASURE

(40) [SONG#/MEASURE] Display	31
(41) [SONG#] Buttons [-], [+]	31

SONG MEMORY

(42) [MELODY] Buttons [1]~[5]	30
(43) [VECTOR SYNTH] Button	30
(44) [PAD] Button	30
(45) [AUTO ACCOMP.] Button	30

	page
(46) [RECORD] Button	31
(47) [CLEAR] Button	33
(48) [RESET] Button	33
(49) [REWIND] Button	33
(50) [STOP] Button	32
(51) [PLAY] Button	32
(52) [FAST FORWARD] Button	33

DEMO

(53) [DEMO START/STOP] Button	8
-------------------------------------	---

SOUND EFFECT

(54) [SOUND EFFECT PADS] [1]~[4]	26
--	----

WHEEL

(55) WHEEL	28
------------------	----

KEYBOARD

(56) ACCOMPANIMENT SECTION	20
(57) MELODY SECTION	20

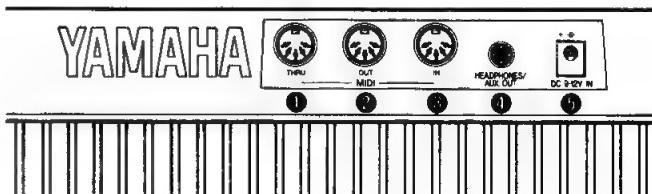
PERCUSSION

(58) [PERCUSSION PADS] [1]~[8]	25
--------------------------------------	----

SELECTION LISTS

(59) STYLE List	18
(60) VOICE List	14
(61) SOUND EFFECT List	26
(62) PERCUSSION List	25
(63) HARMONY List	16
(64) WHEEL FUNCTION List	28

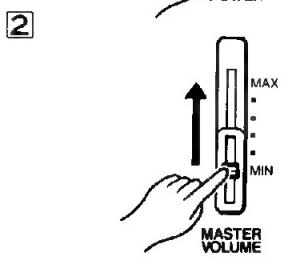
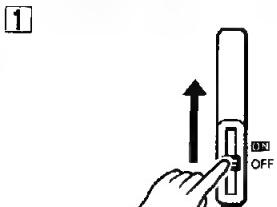
■ REAR PANEL



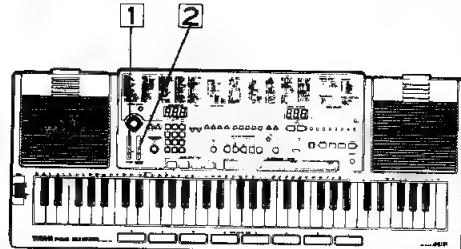
	page
(1) [MIDI THRU] Connector	40
(2) [MIDI OUT] Connector	40
(3) [MIDI IN] Connector	40
(4) [HEADPHONES/AUX. OUT] Jack	5
(5) [DC 9-12V IN] Jack	4

1. TUTORIALS

TURN THE POWER ON/ SET THE MASTER VOLUME



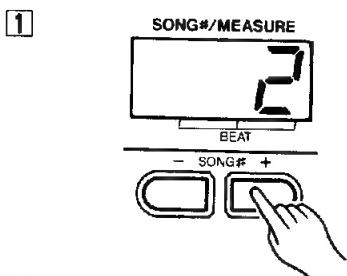
1 Turn the [POWER] switch ON.



2 Slide the [MASTER VOLUME] control up or down to adjust the volume.

PLAY A DEMO

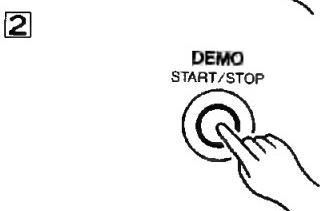
The PSS-51 is equipped with three songs that demonstrate the sophisticated capabilities of the instrument.



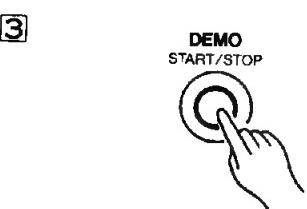
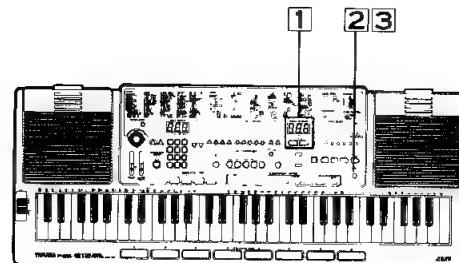
1 Select the desired demonstration song number.

Press the SONG# [+] or [-] buttons beneath the [SONG#/ MEASURE] display to select one of the three demonstration songs.

The song number will be displayed in the [SONG#/MEASURE] display.



2 Press the [DEMO START/STOP] button to start the demonstration.



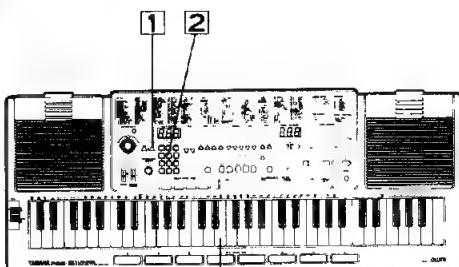
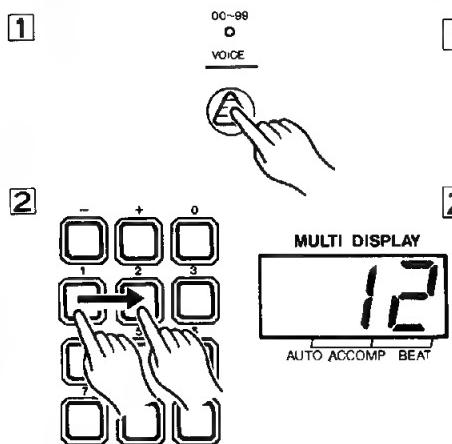
3 Press the [DEMO START/STOP] button again to stop the demonstration. The 3 songs will repeat continuously in a chain from the selected song number until the [DEMO START/STOP] button is pressed again.

It is possible to play along with the demonstration songs. Adjust the VOICE and other features as desired.

NOTE: The demonstration can also be stopped by pressing the SONG MEMORY [STOP] button or the ACCOMPANIMENT CONTROL [START/STOP] button.

SELECT AND PLAY VOICES

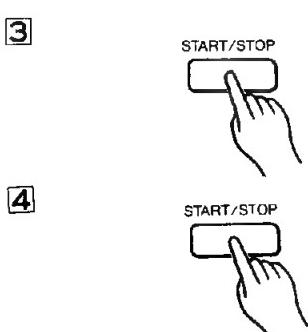
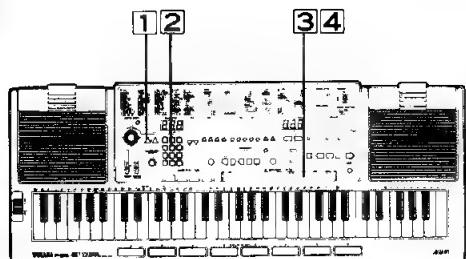
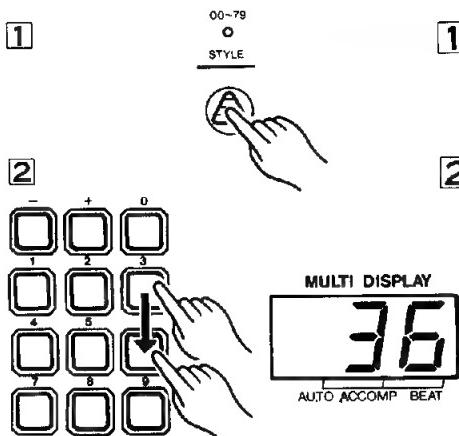
There are 100 VOICES to choose from. Refer to the VOICE list on the front panel and select the desired VOICE.



3 Play any key on the keyboard to hear the selected VOICE.

SELECT AND PLAY RHYTHM STYLES

There are 80 STYLES to choose from. Refer to the STYLE list on the front panel and select the desired STYLE.



PLAY WITH AUTO ACCOMPANIMENT

1

00~79
0
STYLE



- 1** Select the desired STYLE as outlined on Page 9.

2

FINGERING
○ ○
SINGLE FINGER FIN-GERED



- 2** Press the [SINGLE FINGER] button in the FINGERING section of AUTO ACCOMPANIMENT.

3

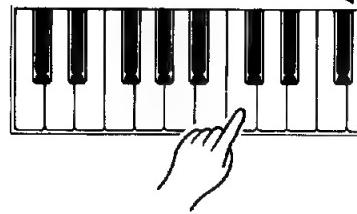
- 3** Press the [INTRO] button of ACCOMPANIMENT CONTROL.



4

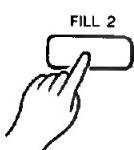
- 4** Press any key in the ACCOMPANIMENT SECTION (located on the left side of the keyboard).

Play several chords. Refer to page 20 for a detailed explanation of SINGLE FINGER accompaniment.



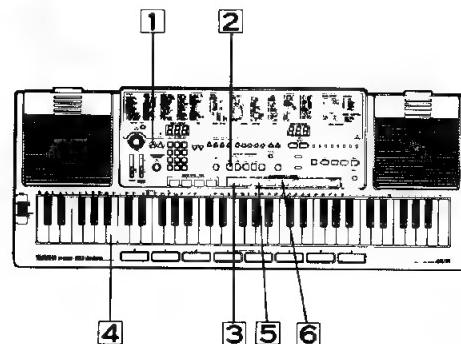
5

- 5** Press the [FILL 2] button to add a short fill.



6

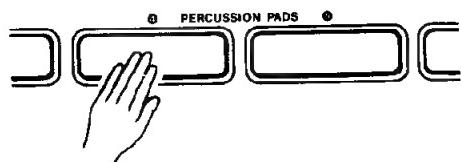
- 6** Press the [ENDING] button to stop the AUTO ACCOMPANIMENT with an appropriate ending.



STRIKE PERCUSSION PADS

1

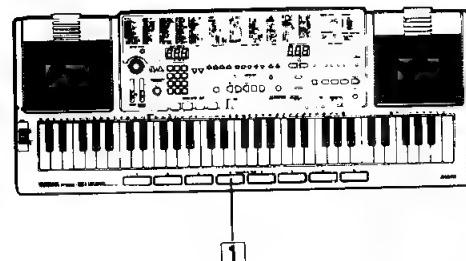
1



- Strike any of the PERCUSSION PADS.**

There are 10 different PERCUSSION categories. Each category has 8 different PERCUSSION sounds; one sound for each pad. The default percussion sound is "ROCK" (number 0), but other sounds can be easily selected.

Refer to "PERCUSSION PADS" on page 25 for details.



The default setup is as follows:

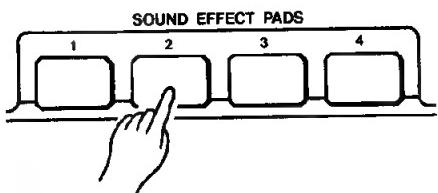
● DEFAULT PERCUSSION SETUP

No.	Category	PAD 1	PAD 2	PAD 3	PAD 4	PAD 5	PAD 6	PAD 7	PAD 8
0	ROCK	Bass Drum Low 	Snare Low 	Tom Low 	Tom High 	Hi-Hat Closed 	Hi Hat Open 	Crash Cymbal 	Ride Cymbal 2

PRESS SOUND EFFECT PADS

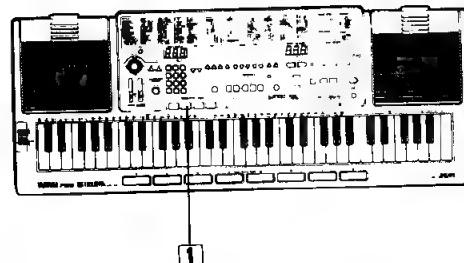
1

1



- Press any of the SOUND EFFECT PADS.**

There are 10 different SOUND EFFECT combinations. Each combination has 4 different SOUND EFFECT sounds; one sound for each pad. The default sound effect is "SAFARI" (number 0), but other sound effects can be easily selected. Refer to "SOUND EFFECT PADS" on page 26 for details.

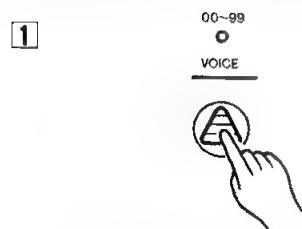


The default setup is as follows:

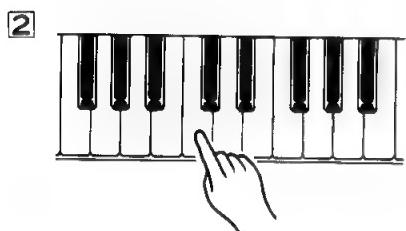
● DEFAULT SOUND EFFECT SETUP

No.	Combination	PAD 1	PAD 2	PAD 3	PAD 4
0	SAFARI	Elephant	Lion	Monkey	Percussion

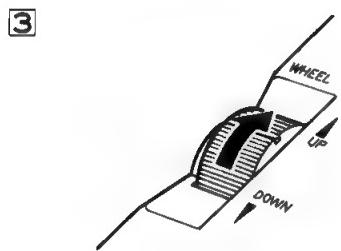
ROTATE THE WHEEL



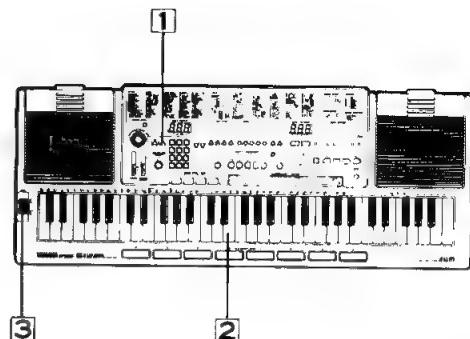
- 1** Select VOICE number 18
(E. Guitar 1).
Refer to "SELECT AND PLAY VOICES" on page 9.



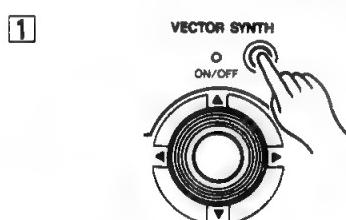
- 2** Press any key to play a note.



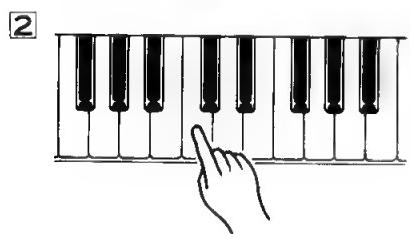
- 3** While holding the key down, rotate the WHEEL upward or downward to bend the pitch of the note higher or lower.
Refer to "WHEEL" on page 28 for details.



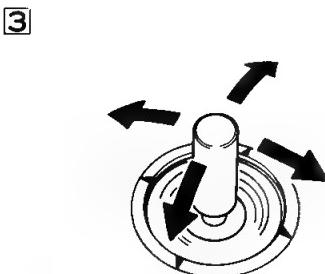
MOVE THE VECTOR SYNTH JOYSTICK



- 1** Press the [VECTOR SYNTH ON/OFF] button to start the Vector Synthesizer (the [ON/OFF] indicator will be lit).

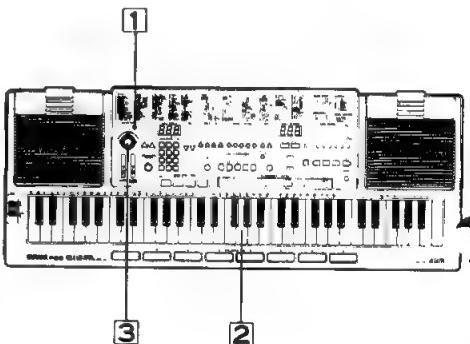


- 2** Play any note.

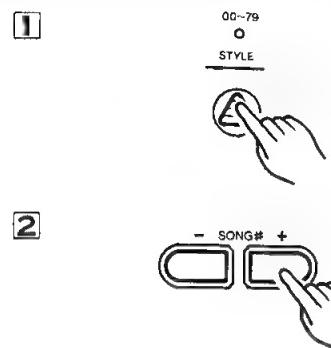


- 3** While holding the key down, freely move the joystick upwards, downwards, left, and right.

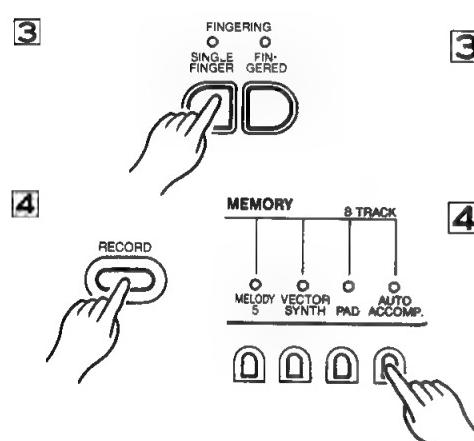
The default VOICES will be heard. Move the joystick to the center and all four VOICES will be heard simultaneously. Refer to "VECTOR SYNTH" on page 27.



RECORD WITH AUTO ACCOMPANIMENT



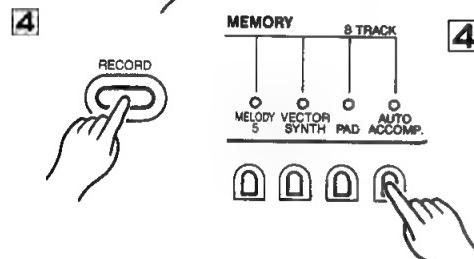
- 1** Choose the desired STYLE as outlined on page 9.



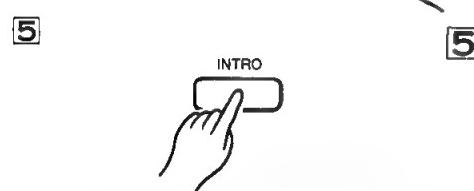
- 2** Press the SONG# [+] button twice to record song number 2.



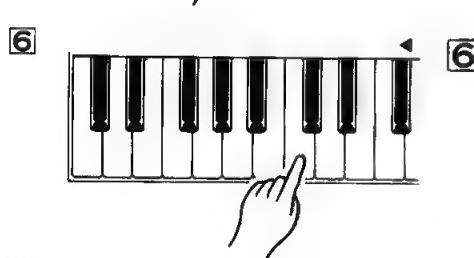
- 3** Press the [SINGLE FINGER] button of AUTO ACCOMPANIMENT.



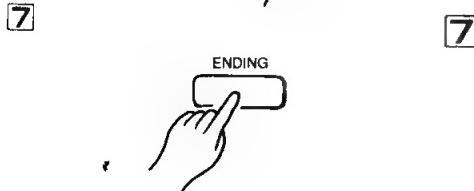
- 4** While pressing the [RECORD] button, press the SONG MEMORY [AUTO ACCOMP.] button.
(The PSS-51 will generate a record waiting signal.)



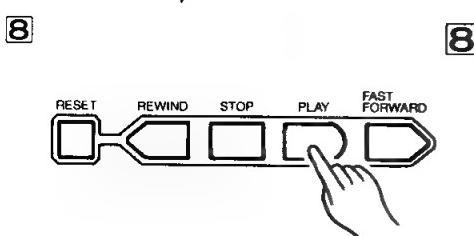
- 5** Press the [INTRO] button of ACCOMPANIMENT CONTROL.



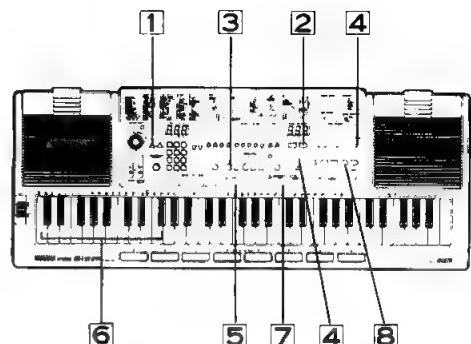
- 6** Press any key in the ACCOMPANIMENT SECTION of the keyboard to start the recording.



- 7** Press the [ENDING] button of ACCOMPANIMENT CONTROL to end the recording process.



- 8** Press the [PLAY] button to listen to your recording.



2. OPERATION GUIDE

2.1 SETTING THE VOICE

VOICE

Range: 00~99, Default: 00



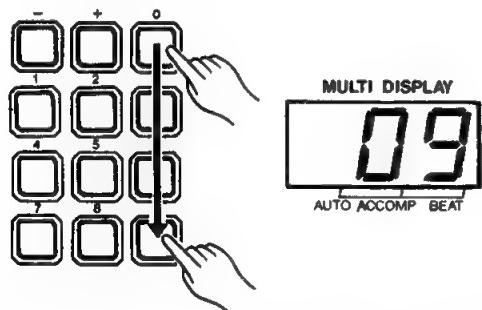
1. Select a Voice from the VOICE list on the front panel.

The VOICE list contains 100 sounds.

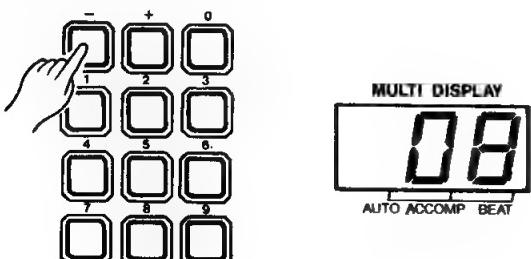
2. Press the [VOICE] button.

The current VOICE number will appear in the MULTI DISPLAY.

3. Refer to the MULTI DISPLAY and enter the VOICE number using the numeric keypad [0]~[9] buttons. Two digits must be pressed to activate the voice. For example, to select voice 09 (CELESTA), first press the number [0], followed by the number [9].



Press the [+]/[-] buttons to increment or decrement the VOICE number. Holding down the appropriate button will increment or decrement the VOICE number continuously.



■ KEYBOARD PERCUSSION

When any of the PERCUSSION voices (numbers 94~99) are selected, a wide range of drum and percussion instruments can be played on the keyboard.

PERCUSSION voices 94~97 generate sounds as marked in the VOICE list. The percussion instruments played by VOICE 98 (PERCUSSION W/GATE) and VOICE 99 (PERCUSSION) are indicated by the symbols above the keys.

Refer to the following tables for PERCUSSION key assignments.

2. OPERATION GUIDE

● PERCUSSION KEY ASSIGNMENTS

94 SCRATCH W/PITCH

Key	Instrument
C1~C6	Scratch

95 KICK & SNARE W/PITCH

Key	Instrument
C1~B1	Bass Drum Heavy
C2~B2	Bass Drum Light
C3~B3	Snare Low
C4~B4	Snare High
C5~C6	Synth Snare

96 TOM W/PITCH

Key	Instrument
C1~B2	Acoustic Tom
C3~C6	Synth Tom

97 LATIN PERCS W/PITCH

Key	Instrument
C1~B1	Conga
C2~B2	Bongo
C3~B3	Timbale
C4~B4	Agogo
C5~C6	Cuica

98 PERCUSSION W/GATE

99 PERCUSSION

Key	Instrument	Key	Instrument
C1		C4	
C#1		C#4	
D1		D4	
D#1		D#4	
E1		E4	
F1		F4	
F#1		F#4	
G1		G4	
G#1		G#4	
A1		A4	
A#1		A#4	
B1		B4	
C2		C5	
C#2		C#5	
D2		D5	
D#2		D#5	
E2		E5	
F2		F5	
F#2		F#5	
G2		G5	
G#2		G#5	
A2		A5	
A#2		A#5	
B2		B5	
C3		C6	
C#3			
D3			
D#3			
E3			
F3			
F#3			
G3			
G#3			
A3			
A#3			
B3			

* Voice 98 (PERCUSSION W/GATE) will cut off the sound the moment the key is released. VOICE 98 sounds are the same as those for VOICE 99.

2.2 SETTING THE VOICE EFFECTS

The PSS-51 has four very useful voice effects — VOLUME, HARMONY, SUSTAIN, and REVERB — to enrich the selected voice and extend your musical possibilities. The following sections explain the operation of these functions in detail.

VOLUME

Range: 0~24, Default: 21



Although the MASTER VOLUME is used to set the overall volume level, the volume of the chosen voice can be independently adjusted in relation to all the other sounds.

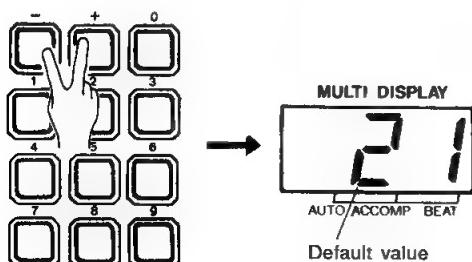
1. Press the [VOL.] button.

The current volume level will appear on the MULTI DISPLAY.



2. Adjust the volume.

Use the [+] button on the keypad to increase the volume or the [-] button to decrease the volume. The selected volume level will be displayed on the MULTI DISPLAY as the volume is adjusted. The volume range can be adjusted from 0 to 24; 21 is the default setting. The default can be recalled by pressing the [+] and [-] buttons simultaneously.



NOTE: When AUTO ACCOMPANIMENT is selected, the volume effect is only active for the MELODY SECTION of the keyboard.

HARMONY

Range: 0~14, Default: 00



HARMONY Types

00	DUET
01	TRIO
02	BLOCK
03	COUNTRY
04	OCTAVE
05	STRUM
06	TREMOLO
07~10	ECHO
11~14	HARMONY+ECHO

The PSS-51 comes equipped with 15 HARMONY types as shown in the HARMONY list on the front panel. Appropriate harmony notes are automatically added to any note played on the keyboard.

When the HARMONY effect is used with AUTO ACCOMPANIMENT, any note played in the MELODY SECTION of the keyboard will have the effect.

1. Select the HARMONY type from the HARMONY list on the front panel.

2. Press the [HARMONY] button.

The current [HARMONY] number will appear on the MULTI DISPLAY.

3. Enter the desired HARMONY number.

Refer to the MULTI DISPLAY and use the [+] or [-] buttons on the keypad to select the desired harmony type. (The selected harmony number will appear on the MULTI DISPLAY.) The HARMONY number can be freely changed any time the [HARMONY] indicator is lit.

4. Press the [HARMONY ON/OFF] button to turn the effect ON or OFF.

If the effect is ON, the [HARMONY ON/OFF] indicator will be lit.

* Only a single note can be played at a time on the keyboard when the HARMONY features 00~05 and 11~14 are used.

* Some of the HARMONY produced is based on the chord played in the ACCCOMPANIMENT SECTION of the keyboard while in the FINGERED and SINGLE FINGER modes.

* When the VECTOR SYNTH is turned ON, the HARMONY function cannot be used.

* Turning the HARMONY feature ON will not affect any notes played at the time the button is pressed. Subsequent notes will have the HARMONY effect. (HARMONY TYPE 00~05, 11~14)

2. OPERATION GUIDE

SUSTAIN

Range: 0~1, Default: 0

0~1
○
SUS-
TAIN



The SUSTAIN effect holds the notes of certain voices a little longer. This effect causes these voices to fade out more slowly when the keys are released. The result is a more enriched, fuller sound for these voices.

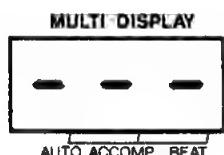
1. Press the [SUSTAIN] button.

The current [SUSTAIN] number will appear on the MULTI DISPLAY.

2. Turn the SUSTAIN effect ON or OFF.

Use the [+] or [-] buttons on the keypad to turn SUSTAIN ON or OFF. Press the [-] button and a "0" will appear on the MULTI DISPLAY indicating that the SUSTAIN effect is OFF. Pressing the [+] button once switches the MULTI DISPLAY reading to "1"; the SUSTAIN effect is active.

NOTE: Not all VOICES have the SUSTAIN effect. VOICES without a SUSTAIN effect will display a "---" on the MULTI DISPLAY.



REVERB

Range: 0~3, Default: 0

0~3
○
REVERB



The REVERB feature adds an echo-like effect to increase the depth and width of certain voices. The result is a more panoramic sound.

1. Press the [REVERB] button.

2. Enter the length of REVERB.

Use the [+] or [-] buttons on the keypad to control the reverb effect. A "0" reading on the MULTI DISPLAY indicates that the REVERB effect is off. Pressing the [+] button will increment the value on the MULTI DISPLAY and implement the REVERB effect: "1" is weak reverb while "3" is strong.

NOTE: Not all VOICES have the REVERB effect. VOICES without a REVERB effect will display a "---" on the MULTI DISPLAY.

2.3 AUTO ACCOMPANIMENT

The PSS-51 has a sophisticated AUTO ACCOMPANIMENT function that provides a wide range of musical styles and rhythms. A completely orchestrated accompaniment will be automatically produced according to one of the 80 STYLES selected and the chord played. Use the outline below to get full benefit from the AUTO ACCOMPANIMENT features.

1. Select the desired rhythm **STYLE**.
2. Set the **TEMPO**, if desired.
3. Set the **ACCOMP. VOL.**, if desired.
4. Select the **FINGERING** mode.
5. Select the **ORCHESTRATION**; **LARGE** is the default.
6. Consult the **ACCOMPANIMENT CONTROL** features.



00~79



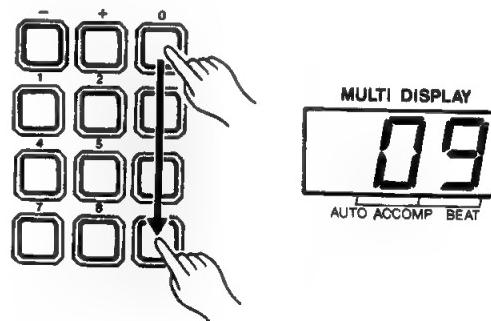
STYLE



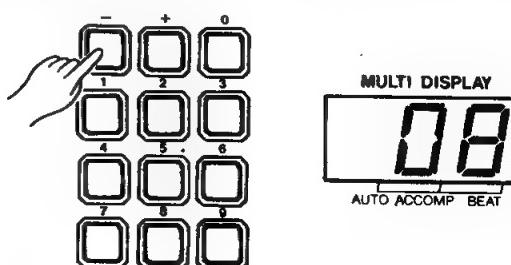
The **STYLE** list on the front panel has 80 rhythm styles. Select one of these 80 styles.

1. Press the **[STYLE]** button.
The current **[STYLE]** number will appear on the **MULTI DISPLAY**.
2. Refer to the **MULTI DISPLAY** and enter the **STYLE** number using the numeric keypad **[0]~[9]** buttons.

Two digits must be pressed to activate the style. For example, to select style 09 (ROCK SHUFFLE 1), first press the number **[0]**, followed by the number **[9]**.



Press the **[+]/[-]** buttons to increment or decrement the **STYLE** number by one. For example, pressing the **[-]** button one time after entering style 09 (ROCK SHUFFLE 1) will change the style number to "08" (EURO BEAT 2). Holding down the appropriate button will increment or decrement the **STYLE** number continuously.



2. OPERATION GUIDE

TEMPO

Range: 40-240

40~240



TEMPO



The TEMPO feature is used to control the tempo of the AUTO ACCOMPANIMENT, the SONG MEMORY, and the DEMO playback.

1. Press the [TEMPO] button.

The current TEMPO will appear on the MULTI DISPLAY in quarter-note beats per minute.

2. Set the TEMPO as desired.

Refer to the MULTI DISPLAY and increase or decrease the tempo using the [+]/[-] buttons.

The TEMPO ranges from 40 to 240 beats per minute. Each style comes with a different default tempo that is automatically set whenever the style is selected. If the tempo is changed, the default tempo for a style can be recalled by pressing the [+] and [-] buttons simultaneously.

NOTE: If a new style is selected when the rhythm is stopped, the "default" tempo for that style will automatically be selected as well. On the other hand, if a new style is selected while the rhythm is playing, the new style will maintain the tempo of the previous style.

ACCOMP. VOL.

Range: 0~24, Default: 21

0~24



ACCOMP. VOL.



Although the MASTER VOLUME is used to set the overall volume level, the [ACCOMP. VOL.] button can be used to selectively adjust the volume of the accompaniment in relation to all the other sounds.

1. Press the [ACCOMP. VOL.] button.

The current [ACCOMP. VOL.] level will appear in the MULTI DISPLAY.

2. Adjust the volume.

Use the [+] button on the keypad to increase the volume or the [-] button to decrease the volume. The selected volume level will be displayed on the MULTI DISPLAY while the volume is being adjusted. The volume range can be adjusted from 0 to 24. A setting of 0 produces no sound while a setting of 24 will generate maximum accompaniment volume. The default can be recalled by pressing the [+] and [-] buttons simultaneously.

NOTE: The ACCOMP. VOL. control is only in effect when AUTO ACCOMPANIMENT has been selected. In addition, the control is only active for the ACCOMPANIMENT SECTION of the keyboard.

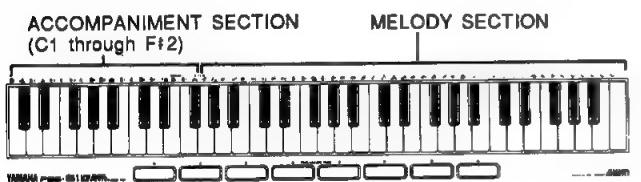
FINGERING



There are two kinds of FINGERING methods provided in AUTO ACCOMPANIMENT: SINGLE FINGER and FINGERED.

SINGLE FINGER mode makes it possible to easily generate chord and bass accompaniment by pressing, one, or at most, three keys in the ACCOMPANIMENT SECTION of the keyboard. FINGERED mode uses normal chord fingering. An appropriate accompaniment will be played according to the selected chords and style.

● FINGERING MODE



If the [SINGLE FINGER] indicator is lit, SINGLE FINGER mode is selected. FINGERED mode is active when the [FINGERED] indicator is lit. Regardless of the mode, accompaniment will begin when any note in the ACCOMPANIMENT SECTION of the keyboard is played (C1 through F#2).

- * AUTO ACCOMPANIMENT will continue even if you are no longer touching the keys in the ACCOMPANIMENT SECTION. You only need to briefly press the Auto Accompaniment keys to change chords.
- * If the SINGLE FINGER or the FINGERED mode is used while the accompaniment is stopped, the appropriate bass and chord sounds will be produced when any of the left-hand keys are pressed. If the STYLE is changed, a corresponding VOICE will automatically be set. Channels 14 and 15 will carry the chord and bass sounds, respectively. The VOICE for each channel can be set independently if desired. (The channel numbers refer to "MIDI CHANNELS" on page 39.)

■ Single Finger

This accompaniment style makes it simple to produce beautifully orchestrated accompaniment using major, seventh, minor, and minor-seventh chords by pressing, one, or at most, three keys in the ACCOMPANIMENT SECTION of the keyboard.

1. Press the [SINGLE FINGER] button.
The corresponding indicator will light and the PSS-51 will automatically be set to standby mode as shown by the 3 flashing dots on the MULTI DISPLAY and the lit [SYNCHRO START/STOP] indicator.
2. Play any note or notes in the ACCOMPANIMENT SECTION of the keyboard.
AUTO ACCOMPANIMENT will begin according to the chord played.

● PLAYING CHORDS

Pressing any of the keys alone in the ACCOMPANIMENT SECTION of the keyboard will play a major chord. However, chord progressions of most songs use other chords as well, such as 7th chords or minor chords. To play these types of chords, press 2 or 3 keys in the ACCOMPANIMENT SECTION simultaneously.

Major Chord	Press the root key
Minor Chord	Simultaneously press the root key and any black key to the left of the root.
7th Chord	Simultaneously press the root key and any white key to the left of the root.
Minor 7th Chord	Simultaneously press the root key, and any black and white key to the left of the root.

*The following examples use "C" as the root key.

A diagram showing four sets of piano keys representing different chords:

- (C) - A single key labeled 'C'.
- (Cm) - Two keys labeled 'C' and 'B' (black key to the left of 'C').
- (C7) - Three keys labeled 'C', 'B', and 'A' (black key to the left of 'C').
- (Cm7) - Four keys labeled 'C', 'B', 'A', and 'G' (black key to the left of 'C').

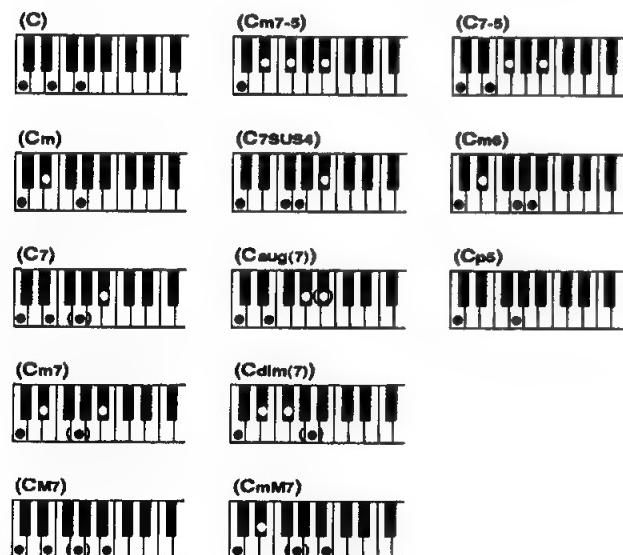
■ Fingered

The FINGERED mode is ideal for playing accompaniment chords using normal fingering. This mode is very flexible, and a large number of chord types can be detected and played. The types of chords detectable in FINGERED mode are listed below:

Chord	Abbreviation	Normal Voicing
Major	M	1-3-5
Minor	m	1-♭3-5
Seventh	7	1-3-(5)-♭7
Minor seventh	m7	1-♭3-(5)-♭7
Major seventh	M7	1-3-(5)-7
Minor seventh flattened fifth	m7-5	1-♭3-♭5-♭7
Seventh suspended fourth	7sus4	1-4-5-♭7
Augmented (seventh)	aug(7)	1-3-♯5-(♭7)
Diminished (seventh)	dim(7)	1-♭3-♭5-(6)
Minor major seventh	mm7	1-♭3-(5)-7
Seventh flattened fifth	7-5	1-3-♭5-♭7
Minor sixth	m6	1-♭3-5-6
Perfect fifth	p5	1-5

* Notes in parentheses may be omitted.

● DETECTABLE CHORDS ON THE ROOT "C"



- For diminished and augmented chords, the lowest key pressed is assumed to be the root.
- Seventh flattened fifth chords will be recognized if either the root or the flattened seventh is the lowest note.
- Minor sixth chords will be properly detected only when they are played in "root position".
- When an octave (the root and the 8th note of its scale) is played, only the root will be produced.
- If the root and the fifth are played, the accompaniment will use only the root and the fifth.

1. Press the [FINGERED] button.

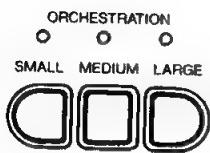
The corresponding indicator will light and the PSS-51 will automatically be set to standby mode as shown by the 3 flashing dots in the MULTI DISPLAY and the lit [SYNCHRO START/STOP] indicator.

2. Play a chord in the ACCOMPANIMENT SECTION of the keyboard.

AUTO ACCOMPANIMENT will begin according to the chord played.

ORCHESTRATION

Default: Large



The ORCHESTRATION feature of AUTO ACCOMPANIMENT is equipped with three variations: SMALL, MEDIUM, and LARGE. These modes vary by degree of ORCHESTRATION provided. Pressing the [SMALL] button generates a bass and rhythm ensemble. The [MEDIUM] button adds chords to liven up the accompaniment. The [LARGE] button rounds out the orchestration with a full ensemble. LARGE is the default ORCHESTRATION, but any of the other variations can be chosen at any time during the accompaniment.

● Performance CH. of the ORCHESTRATION variations

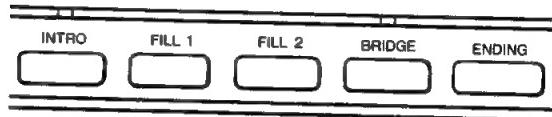
	CH. 10~13 Others	CH. 14 Chord	CH. 15 Bass	CH. 16 Rhythm
SMALL			○	○
MEDIUM		○	○	○
LARGE	○	○	○	○

NOTE: The channel numbers in the above table refer to MIDI channels. See "MIDI CHANNELS" on page 39 for more details.

ACCOMPANIMENT CONTROL

■ Accompaniment Patterns

The ACCOMPANIMENT CONTROL section is equipped with the INTRO, NORMAL, BRIDGE, FILL 1, FILL 2, and ENDING patterns. Switch among these patterns while the accompaniment is playing to add variety to your song structures and sophistication to your performances.



● INTRO

The INTRO pattern is set by pressing the [INTRO] button in the ACCOMPANIMENT CONTROL section. When the corresponding [INTRO] indicator is lit, the INTRO pattern is ready. The selected rhythm is set to begin with an appropriate musical introduction. The introduction will start when the [START/STOP] button is pressed.

While the INTRO is being played the leftmost dot on the MULTI DISPLAY will flash. When the INTRO is finished, the other dots in the MULTI DISPLAY will flash according to the beat of the selected rhythm style.

After the INTRO has completed, the accompaniment will automatically be followed by the NORMAL pattern. (If the [BRIDGE] indicator is lit, the INTRO will be followed by a [BRIDGE] pattern.) The [INTRO] button can be used to select an introduction pattern at any time; even while the accompaniment is playing. The length of each INTRO varies according to the rhythm style selected.

● NORMAL

Each rhythm style has two main patterns — NORMAL and BRIDGE. The default is the NORMAL pattern. When the NORMAL pattern is in effect, the [BRIDGE] indicator is not lit. While the NORMAL mode is selected, a basic rhythm pattern will play continuously.

● BRIDGE

The other main pattern is BRIDGE. This pattern is selected when the [BRIDGE] button is pressed and the [BRIDGE] indicator is lit. BRIDGE produces more complex rhythm patterns and sounds that will continue to play until the BRIDGE indicator goes out. If the NORMAL or BRIDGE pattern is selected while a rhythm is playing, the corresponding pattern will begin from the top of the next measure.

● FILL 1

The PSS-51 provides two rhythmic fill-in patterns, FILL 1 and FILL 2. FILL 1 can be selected from any of the other patterns, but always leads to the NORMAL pattern. Press the [FILL 1] button at any time while the accompaniment is playing to add a short fill-in automatically followed by the NORMAL pattern. If the [FILL 1] button is held down, the pattern will repeat until the button is released, then the NORMAL pattern will begin from the beginning of the next measure.

● FILL 2

The other fill-in pattern is FILL 2 which always leads to the BRIDGE pattern. FILL 2 can be selected from any of the other patterns. Press the [FILL 2] button at any time while the accompaniment is playing to add a short fill-in automatically followed by the BRIDGE pattern. Holding the [FILL 2] button down repeats the pattern until the button is released, then the BRIDGE pattern will begin from the beginning of the next measure.

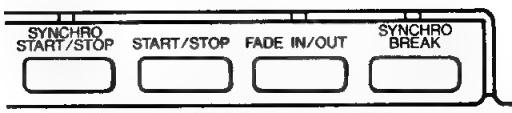
* FILL 1 is followed by a NORMAL pattern and FILL 2 is followed by a BRIDGE pattern automatically. However, if the INTRO, ENDING, NORMAL (for FILL 2), or BRIDGE (for FILL 1) pattern is selected before the end of the fill, the ACCOMPANIMENT will lead to the selected pattern.

● ENDING

Press the [ENDING] button while the accompaniment is playing to select a pre-set ending phrase suitable for the selected rhythm style. The ENDING pattern will begin from the first beat of the next measure, and will stop the accompaniment automatically. While the ENDING phrase is being played, the leftmost dot on the MULTI DISPLAY will flash.

* A fill-in will play if either the [FILL 1] or [FILL 2] button is pressed during the ending pattern, followed by a return to the NORMAL or BRIDGE patterns, respectively.

■ Accompaniment Control

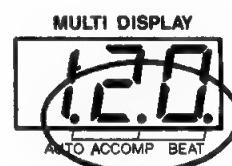


◆ START/STOP

Press the [START/STOP] button to begin the selected rhythm immediately. The rhythm will play without chord or bass accompaniment. Selecting either the SINGLE FINGER or FINGERED mode, and playing any note or chord in the ACCOMPANIMENT SECTION of the keyboard will add chord and bass parts to the rhythm. Pressing the [START/STOP] button again will stop the accompaniment immediately.

About the Beat Display

While the rhythm is playing, the 3 dots on the MULTI DISPLAY provide a visual indication of the beat.



4/4 Time	3/4 Time
1st Beat	● ● ●
2nd Beat	● ○ ○
3rd Beat	○ ● ○
4th Beat	○ ○ ●

◆ SYNCHRO START/STOP

Press the [SYNCHRO START/STOP] button to begin the accompaniment with the first note played on the keyboard. The [SYNCHRO START/STOP] indicator will light when selected. Chord and bass parts can be added by playing in the ACCOMPANIMENT SECTION of the keyboard after the SINGLE FINGER or FINGERED mode has been selected. Pressing the [SYNCHRO START/STOP] button again will stop the accompaniment and reset the synchro start function.

When the [SYNCHRO START/STOP] button is pressed, the three dots on the MULTI DISPLAY and the [SYNCHRO START/STOP] indicator will flash to the beat of the current tempo.

◆ FADE IN/OUT

Press the [FADE IN/OUT] button to gradually increase or decrease the volume of the selected accompaniment style. During FADE IN, the volume will start very quietly and become progressively louder until reaching the selected volume level. Start the FADE IN accompaniment by playing in the ACCOMPANIMENT SECTION of the keyboard when the SINGLE FINGER or FINGERED mode has been chosen. Once the FADE IN is complete, the [FADE IN/OUT] indicator will turn off.

While the accompaniment is playing, press the [FADE IN/OUT] button to begin a FADE OUT. The [FADE IN/OUT] indicator will be lit and the accompaniment will fade out gradually.

◆ SYNCHRO BREAK

The SYNCHRO BREAK function enables you to control the percussion parts of the accompaniment. When any of the SOUND EFFECT PADS or the PERCUSSION PADS are pressed after the [SYNCHRO BREAK] button has been pressed, the preset percussion of the rhythm style will stop until the first beat of the next measure allowing you to add your own pad sounds.

REGISTRATION MEMORY



The PSS-51 is provided with 80 different rhythm STYLES and a corresponding NORMAL and BRIDGE pattern for each STYLE. With REGISTRATION MEMORY, it is possible to automatically select an appropriate registration of VOICE and VOICE EFFECTS for each STYLE.

The preset registrations have been carefully constructed by professional musicians and produce high quality musical arrangements.

■ Using REGISTRATION MEMORY

Any STYLE can be selected from the 80 STYLES listed on the front panel.

1. Select the [BRIDGE] variation if desired.
2. Press the [REGISTRATION MEMORY] button. Preset VOICE and VOICE EFFECTS will be set automatically.
3. Play a song.

The settings of the VOICE and VOICE EFFECT registrations can be changed (refer to pages 16, 17). The changes are stored in memory and can be recalled later by following the steps above.

To recall preset registrations after making changes, press the [+] and [-] buttons simultaneously for the VOICE and each VOICE EFFECT.

NOTE: REGISTRATION MEMORY data is stored as long as there is power supply. If the AC power is disconnected or the batteries' voltage is low, all memory will be lost. REGISTRATION MEMORY data will return to the original preset registration values.

2.4 SOUND ENRICHMENT

2. OPERATION GUIDE

PERCUSSION PADS

Range: 0~9, Default: 0

0~9
O
PER-CUSSION



The PERCUSSION PADS make it simple to add a wide variety of percussion sounds to a musical performance.

Common percussion arrangements can be conveniently selected from the PERCUSSION list on the front panel. For added flexibility, a custom percussion setup can be assigned with the CUSTOM (9) category.

1. Choose one of the 10 percussion categories from the PERCUSSION list on the front panel.

2. Press the [PERCUSSION] button.

The current PERCUSSION number will appear on the MULTI DISPLAY.

3. Enter the desired PERCUSSION number.

Use the [+] or [-] buttons on the keypad to select the desired PERCUSSION type. The PERCUSSION number will appear on the MULTI DISPLAY. The PERCUSSION number can be freely changed any time the [PERCUSSION] indicator is lit.

4. Strike the PERCUSSION PADS marked [1] through [8] as desired.

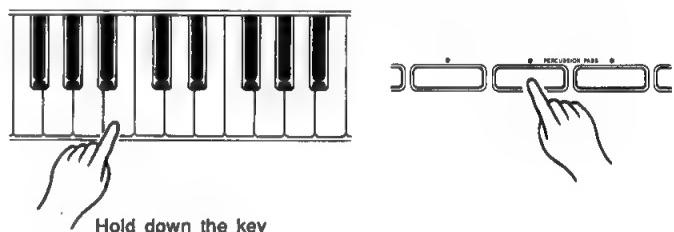
● PERCUSSION CATEGORY LIST

No.	Category	PAD 1	PAD 2	PAD 3	PAD 4	PAD 5	PAD 6	PAD 7	PAD 8
0	ROCK	Bass Drum Low	Snare Low	Tom Low	Tom High	Hi-Hat Closed	Hi-Hat Open	Crash Cymbal	Ride Cymbal 2
1	HOUSE	House Bass Drum	House Snare Drum	House Tom Bass	House Tom Middle	House Hi-Hat	Maracas High	Tambourine	Triangle Open
2	DANCE	Bass Drum Middle	Open Rim Shot	Tom Low	Handclaps	Hi-Hat Closed	Hi-Hat Open	Crash Cymbal	Ride Cymbal 1
3	POP	Bass Drum Middle	Snare Low W/GR	Tom Low	Tambourine	Hi-Hat Closed	Hi-Hat Open	Crash Cymbal	Ride Cymbal 1
4	JAZZ	Bass Drum High	Snare High	Brush Squeeze	Brush Hit	Hi-Hat Foot	Hi-Hat Open	Crash Cymbal	Ride Cymbal 2
5	FUSION	Bass Drum Middle	Snare Low	Tom Low	Cowbell	Hi-Hat Closed	Hi-Hat Open	Splash Cymbal	Ride Cymbal 1
6	SYNTH	Bass Drum Low	Synth Snare	Synth Tom Low	Synth Tom Middle	Hi-Hat Closed	Hi-Hat Open	Crash Cymbal	Splash Cymbal
7	LATIN1	Bongo Low	Bongo High	Bongo Mute	Claves Low	Claves High	Conga Low	Conga High	Conga Mute
8	LATIN2	Cuica Low	Cuica High	Timbale Low	Timbale High	Agogo Low	Agogo High	Cabasa	Whistle
9	CUSTOM	Bass Drum Low	Snare Low	Tom Low	Tom High	Hi-Hat Closed	Hi-Hat Open	Crash Cymbal	Ride Cymbal 2

■ For Custom Assignment:

PERCUSSION pads can be custom assigned from among any of the 61 percussion sounds of VOICE 99. (the percussion sounds are indicated by the small diagrams above the keyboard.)

1. Select PERCUSSION number 9 (CUSTOM) by using the [+] or [-] buttons.
2. Select VOICE number 99.
3. While holding down the key corresponding to the percussion sound you want to assign, press one of the PERCUSSION PADS numbered [1] through [8]. Assign the other pads in the same manner.

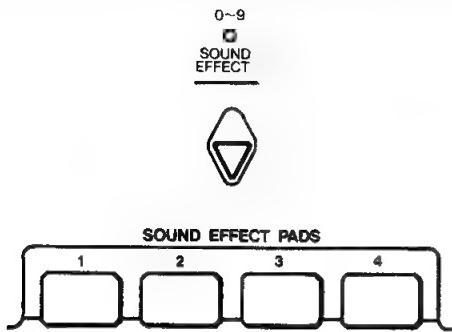


When PERCUSSION number 9 (CUSTOM) is selected, the assigned percussion sounds can be played at any time by striking the appropriate pad. Refer to page 15 "PERCUSSION KEY ASSIGNMENTS".

- * When the VECTOR SYNTH is turned ON, the PERCUSSION PADS cannot be assigned.
- * Custom PERCUSSION PAD assignments will remain in memory as long as there is power supply.
- * Percussion sounds can be assigned to the SOUND EFFECT PADS. (No. 9 CUSTOM)

SOUND EFFECT PADS

Range: 0-9, Default: 0



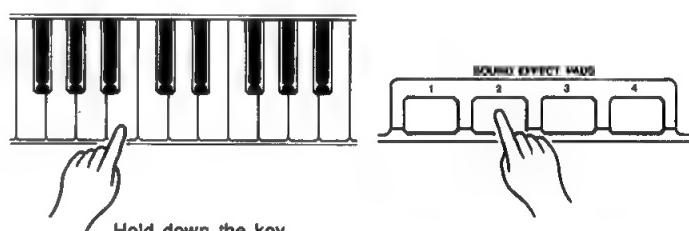
SOUND EFFECT PADS are convenient for adding sound effects to a musical performance. A variety of interesting sound effects can be selected from the SOUND EFFECT list on the front panel.

1. Choose one of the 10 sound effect combinations from the SOUND EFFECT list on the front panel.
2. Press the [SOUND EFFECT] button.
The current SOUND EFFECT number will appear on the MULTI DISPLAY.
3. Enter the desired SOUND EFFECT number.
Use the [+] or [-] buttons on the keypad to select the desired SOUND EFFECT. The SOUND EFFECT number will appear on the MULTI DISPLAY. The SOUND EFFECT number can be freely changed any time the [SOUND EFFECT] indicator is lit.
4. Press the SOUND EFFECT PADS marked [1] through [4] as desired.

■ For Custom Assignment:

SOUND EFFECT pads can be custom assigned from among any of the 40 sound effects of VOICE 99.

1. Select SOUND EFFECT number 9 (CUSTOM) by using the [+] or [-] buttons.
2. Select VOICE number 99.
3. Press the [TRANSPOSE] button and set the pitch (refer to page 38).
A transposition value of -24 or 24 is recommended.
4. While holding down the key corresponding to the sound effect you want to assign, press one of the SOUND EFFECT PADS numbered [1] through [4]. Assign the other pads in the same manner.



Hold down the key

When SOUND EFFECT number 9 (CUSTOM) is selected, the assigned sound effects can be played at any time by striking the appropriate pad.

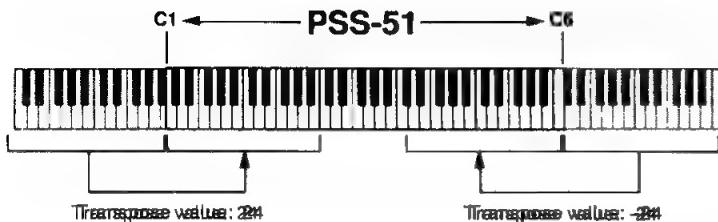
- * When the VECTOR SYNTH is turned ON, the SOUND EFFECT PADS cannot be assigned.
- * Custom SOUND EFFECT assignments will remain in memory as long as there is power supply.
- * Sound effects can also be assigned to the PERCUSSION PADS. (No. 9 CUSTOM)

● SOUND EFFECT COMBINATION LIST

No.	Combination	PAD 1	PAD 2	PAD 3	PAD 4
0	SAFARI	Elephant	Lion	Monkey	Percussion
1	CAR	Brakel	Horn	Start&Idle	Accelerate
2	FOREST	Chirp	Bird 1	Bird 2	Brook
3	PET	Cat	Dog 1	Dog 2	Rooster
4	OCEAN	Boat	Marine Horn	Seagull	Wave
5	SPORTS	Tennis	Basketball	Baseball	Golf
6	TELEPHONE	Push Tones	Busy Signal	Call Signal	Voice
7	TRAIN	Crossing Bell	Steam Whistle	Steam Engine	Train
8	WESTERN	Cowboy	Horse Gallop	Horse	Cow
9	CUSTOM	Rain	Thunder	Wind	Frogs

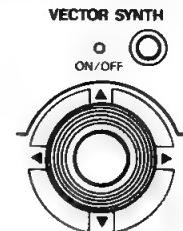
2. OPERATION GUIDE

● SOUND EFFECT TRANSPOSITION



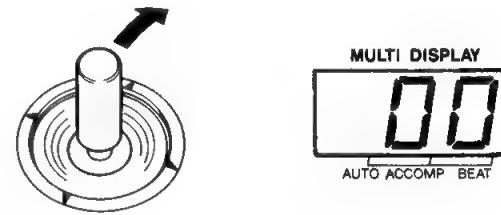
VECTOR SYNTH

Range: 00~99



The VECTOR SYNTH feature allows the PSS-51 to be assigned with four different VOICES at the same time. It is possible to balance each of the four assigned VOICES using the joystick. The VOICES can be chosen from any of the 100 presets for flexible real-time sound combinations.

1. Select the desired VOICE from the VOICE list on the front panel (refer to page 14).
2. Press the [VECTOR SYNTH ON/OFF] button. The indicator will light.
3. Move the joystick fully in any direction (upward, downward, right, or left). The MULTI DISPLAY will indicate the VOICE number according to the position of the joystick.



4. Enter the selected VOICE number using the keypad (refer to page 14). The VOICE EFFECT functions (VOLUME, SUSTAIN, and REVERB) can also be changed as desired.
5. Repeat steps [1] to [4] to assign a VOICE to the other three directions.

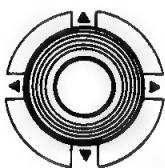
● SOUND EFFECT KEY ASSIGNMENTS

99 PERCUSSION

Key	Instrument	Key	Instrument
C-2	Elephant	C6	House Hi-Hat
C#-2	Lion	C#6	Push Tones
D-2	Monkey	D6	Busy Signal
D#-2	Percussion	D#6	Call Signal
E-2	Brake!	E6	Voice
F-2	Horn	F6	Crossing Bell
F#-2	Start&Idle	F#6	Steam Whistle
G-2	Accelerate	G6	Steam Engine
G#-2	Chirp	G#6	Train
A-2	Bird 1	A6	Cowboy
A#-2	Bird 2	A#6	Horse Gallop
B-2	Brook	B6	Horse
C-1	Cat	C7	Cow
C#-1	Dog 1	C#7	Rain
D-1	Dog 2	D7	Thunder
D#-1	Rooster	D#7	Wind
E-1	Boat	E7	Frogs
F-1	Marine Horn	F7	
F#-1	Seagull	F#7	
G-1	Wave	G7	
G#-1	Tennis	G#7	
A-1	Basketball	A7	
A#-1	Baseball	A#7	
B-1	Golf	B7	
C1	Bass Drum Low	C8	

6. Play any note on the keyboard and simultaneously move the joystick in any direction.

Four different VOICES for the same key will be heard in succession. If the joystick is moved to the exact center, all four voices will be heard at the same time.



7. Press the [VECTOR SYNTH ON/OFF] button to turn the VECTOR SYNTH off.

- * When the VECTOR SYNTH is turned OFF, the joystick will be disabled but the selected VOICES and corresponding VOICE EFFECTS will remain in memory as long as there is power supply.
- * When VECTOR SYNTH is ON, HARMONY is disabled.
- * WHEEL functions will apply to all 4 VOICES at the same time and with equal intensity when VECTOR SYNTH is ON.

WHEEL

Range: 0~3, Default: 0

0~3
○
WHEEL



WHEEL Types

0	PITCH BEND
1	MODULATION
2	TEMPO
3	TEMPO&PITCH

The WHEEL control is equipped with 4 assignable functions as listed on the front panel.

The WHEEL can be used to inflect or bend the pitch or modulation of any VOICE played on the keyboard. The WHEEL function also allows you to vary the tempo, and the tempo and pitch. The type of inflection varies according to the selected WHEEL function.

0 PITCH BEND

The WHEEL can be used to inflect or bend the pitch of any VOICE on the keyboard. The pitch can be inflected anywhere in the range of -12 to 12 (one octave down or up). The value of the inflection will appear on the MULTI DISPLAY.

1 MODULATION

This feature allows you to modulate gradually from one note to another. The modulation range is from 1 to 7. The played notes can be modulated within the range. The assigned modulation value is shown on the MULTI DISPLAY.

2 TEMPO

The WHEEL can also affect the tempo of the accompaniment. Rotate the WHEEL to vary the tempo within the assigned range (20 to 120 quarter-note beats per minute). The current rhythm tempo will appear on the MULTI DISPLAY.

NOTE: If the tempo value becomes greater than 240 or less than 40 through the rotation of the wheel, "S t P" (stop) will appear on the MULTI DISPLAY, and the rhythm will immediately stop.



3 TEMPO&PITCH

The tempo and the pitch can simultaneously be inflected up or down by rotating the WHEEL. The ranges for the tempo and pitch will be the settings of the individual tempo and pitch functions. In this case, “---” will appear on the MULTI DISPLAY during rotations.

■ To set the WHEEL function:

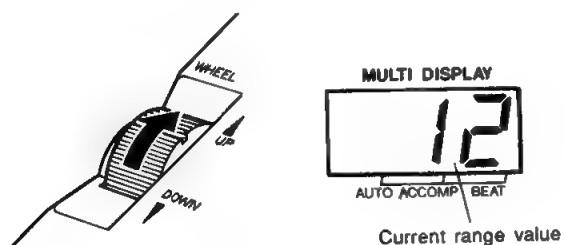
There are 4 functions to choose from. Refer to the WHEEL list on the front panel and select a function.

1. Press the [WHEEL] button.**2. Enter the desired WHEEL number.**

Use the [+] or [-] buttons on the keypad to select the desired WHEEL type. The selected wheel number will appear in the rightmost digit of the MULTI DISPLAY. The WHEEL number can be freely changed any time the [WHEEL] indicator is lit.

■ To set the WHEEL range:**1. Rotate the WHEEL all the way in either direction.**

The current range value will appear on the MULTI DISPLAY.

**2. Set the desired range.**

Use the [+] or [-] buttons to set the desired range. The range depends on the particular WHEEL function.

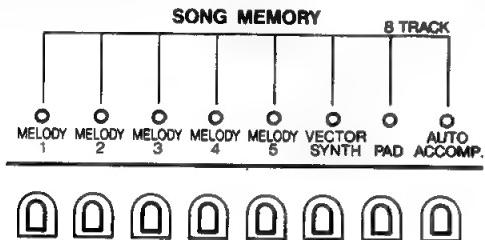
3. Once the range is selected, release the WHEEL.

- * For the pitch bend function, selecting a negative setting will reverse the WHEEL operation; rotating the wheel DOWN will increase the pitch.
- * If VOICE or STYLE is changed, the range will remain the same. WHEEL ranges will remain in memory as long as there is power supply.

2.5 SONG MEMORY

The PSS-51 features an 8 track SONG MEMORY for recording and playback of up to 8 songs. As many as 5 MELODY tracks can be included for professional sounding multi-track recording. The SONG MEMORY is also configured to take specific advantage of the AUTO ACCOMPANIMENT features, the PAD functions, and the VECTOR SYNTH functions.

RECORDING TRACKS



The 8 recording tracks of the PSS-51 are configured for recording specific sounds and digital data as follows:

[MELODY] Tracks (1~5)

The [MELODY] tracks can record any notes played on the keyboard and any changes including the following: VOICE number, VOICE EFFECTS (including HARMONY ON/OFF), and WHEEL data.

[VECTOR SYNTH] Track

The [VECTOR SYNTH] track can record the four VOICES assigned to the VECTOR SYNTH and any changes of the voice balance from moving the joystick. It also records VOICE EFFECT changes and WHEEL inflections.

[PAD] Track

The [PAD] track records any sounds produced by playing the [SOUND EFFECT] and [PERCUSSION] pads, as well as any category changes made during the recording.

[AUTO ACCOMP.] Track

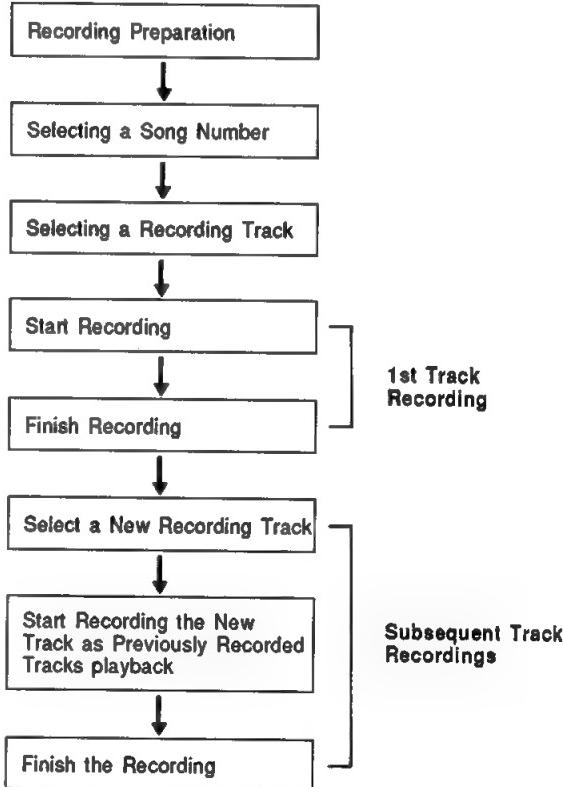
The [AUTO ACCOMP.] track records the rhythm STYLE accompaniment. ORCHESTRATION and FINGERING changes, ACCOMPANIMENT CONTROL changes, variations in rhythm STYLE, TEMPO, ACCOMP. VOL., SYNCRO BREAK ON/OFF, and FADE IN/OUT can also be recorded.

NOTE: Every track will record and playback whatever is played during the recording for that track, including any changes done during the recording. Basically, what you hear is what you get when recording.

RECORDING

■ Basic Recording Procedure

The PSS-51 contains a recording feature which allows 8 original songs to be recorded and played back. The various features make it easy to record almost any kind of song desired. The basic recording procedure is as follows:



CAUTION:

Be very careful with SONG MEMORY during recording or playback. If the SONG MEMORY feature is being used and the unit is intentionally or accidentally turned off using the POWER switch, or the AC adaptor is disconnected, or the batteries' voltage is low, recorded songs in memory will be lost. These recordings cannot be recalled.

■ Recording Preparation

Prepare to make a recording. Consider the following information regarding track selection.

[MELODY] Tracks (1~5)

Choose a VOICE from the VOICE list on the front panel. Enter the VOICE number and set the desired VOICE EFFECTS. (It is possible to change the VOICE number or the VOICE EFFECT settings at any time before or during recording).

[VECTOR SYNTH] Track

Select and mix the desired voices with appropriate voice effects for the four vector directions (refer to page 27). When the VECTOR SYNTH track is chosen for recording, the [VECTOR SYNTH ON/OFF] indicator is automatically turned ON. (The VOICE number and the VOICE EFFECT assignment can be changed any time before or during recording).

[PAD] Track

Select the desired PERCUSSION category and SOUND EFFECT combinations. Assign any percussion sounds or sound effects to the pads (refer to pages 25, 26).

[AUTO ACCOMP.] Track

Select the desired rhythm STYLE and ORCHESTRATION. If both [FINGERING] indicators are off and the [AUTO ACCOMP.] button is pressed for recording, the FINGERED mode will be set automatically. If the [SINGLE FINGER] indicator is lit before the AUTO ACCOMP. track enters the standby mode, the SINGLE FINGER mode is set. (Rhythm STYLE, ORCHESTRATION, and FINGERING settings can all be changed before or during the recording procedure).

HINT: It may help to prepare a track sheet to remember what has been recorded on each track. This will make it easier to achieve and reproduce the desired VOICE EFFECT and OVERALL CONTROL mixes for each track and will result in a more balanced composition.

SONG NAME _____				
Track	VOICE	VOLUME	HARMONY	---
MELODY 1				
MELODY 2				
MELODY 3				
...				

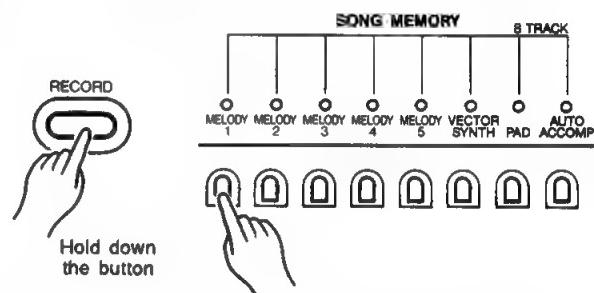
■ Making a Recording

1. Select a Song Number

Press the SONG# [+] or [-] buttons to select the song number to record. Up to 8 songs can be stored in the song memory. The SONG#/MEASURE display will show the selected song number, then return to "001" (indicating the current measure).

2. Select a Recording Track

While holding down the [RECORD] button, press the desired track button to record on that track. The indicator of the selected track, the 3 dots in the [SONG#/MEASURE] display, and the indicator of the [SYNCHRO START/STOP] button will flash indicating the PSS-51 is ready to record. Along with the dots, a metronome of the current tempo will sound from the speakers. To cancel a selected track, press the corresponding track button again.



It is possible to record more than one track at a time. Refer to the table below for track combinations for simultaneous recording.

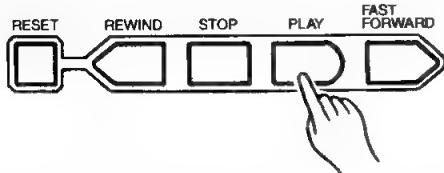
● Simultaneous Track Recording Combinations

- 1) Any one Melody track or Vector Synth and Pad and Auto Accomp.
- 2) Any one Melody track or Vector Synth and Pad
- 3) Any one Melody track or Vector Synth and Auto Accomp.
- 4) Pad and Auto Accomp.
- 5) Any single track alone

3. Start Recording

There are two ways to start recording:

- i) Press the [PLAY] button of SONG MEMORY.



- ii) Play any key on the keyboard or press any pad.

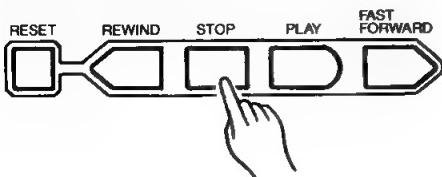
- * If a FINGERING mode is chosen, playing any note or chord in the ACCOMPANIMENT SECTION of the keyboard will start AUTO ACCOMP. recording. Playing any key in the MELODY SECTION will start recording the rhythm only (percussion beat).

During the recording, the [SONG#/MEASURE] display will show the current measure number for the recording. The flashing dots display the beat of the current TEMPO. During recording, the selected tracks will continue to flash and the metronome will be heard. If the [AUTO ACCOMP.] track is being recorded, the metronome will not sound; the rhythm will be heard instead.

HINT: While holding down the [RECORD] button, press the [PLAY] button. This will automatically prepare the [AUTO ACCOMP.] and [MELODY 1] tracks for simultaneous recording.

4. Finish Recording

Press the [STOP] button of SONG MEMORY to conclude recording on the specified tracks. If the [AUTO ACCOMP.] track is being recorded, the [START/STOP] button of ACCOMPANIMENT CONTROL can end the recording immediately or the [ENDING] button will provide a musical ending before stopping the recording. Once the recording is finished, the [SONG#/MEASURE] display will automatically show the starting measure number of the recording. The indicators of the tracks just recorded will stop flashing but will remain lit.



5. Recording Additional Tracks

Follow the same procedures (steps 1 to 4) to record more tracks. Remember to select only the tracks that you want to record. Once a track begins recording, any previous recording on that track is erased from the starting measure number. To listen to previously recorded tracks while recording a new track, make sure the corresponding indicator's for those tracks are lit. Any recorded track can be excluded from playing back by pressing the track's select button and turning off the indicator.

● Song Length

The tracks for a particular song can have different lengths. The length of the song will be the length of the longest track. If a [MELODY] track goes on longer than the [AUTO ACCOMP.] track, the melody will be unaccompanied for that time. As a result, when recording a song, it is advisable to record the [AUTO ACCOMP.] track first. If the ending measure has been entered on a Track Sheet, subsequent track recordings can end on the same measure for a "musical" finish.

- * If the song memory becomes full during recording, the recording will stop. The [SONG#/MEASURE] display will indicate "F u l l", followed shortly by "0 0 1" (indicating the measure number).



- * Whenever you record with song memory, any previous recording on that track, for that song number, will be erased.

SONG PLAYBACK

Once a recording is finished, the song can be played back to verify what was recorded. Use the [RESET], [REWIND], [STOP], [PLAY], and [FAST FORWARD] buttons to control song playback from any measure desired.

■ To playback a song:

1. Select a Song Number

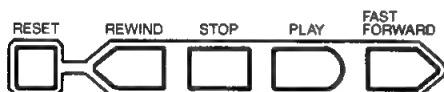
Press the SONG# [+] or [-] buttons to select the song number to playback. The [SONG#/MEASURE] display will show the selected song number.

2. Select/Cancel the Playback Tracks

Tracks with recorded data will be automatically selected (the indicators will be lit). To cancel a selected track, press the corresponding track button.

3. Start Playback

Use the [FAST FORWARD] and [REWIND] buttons to get to a particular measure, then press the [PLAY] button of SONG MEMORY to start the playback. If the [RESET] button is pressed at any time, even during playback, the measure number will return to the beginning of the song.



4. Finish Playback

Press the [STOP] button of SONG MEMORY to finish song playback at any time. If the end of the recorded song is reached, the MULTI DISPLAY will automatically reset to measure "0 0 1" and the playback will stop.

CAUTION:

If the AC power cord is disconnected or the batteries' voltage runs low, song playback will stop. The song data will be lost for the measure playing at the time of stoppage.

SONG EDITING

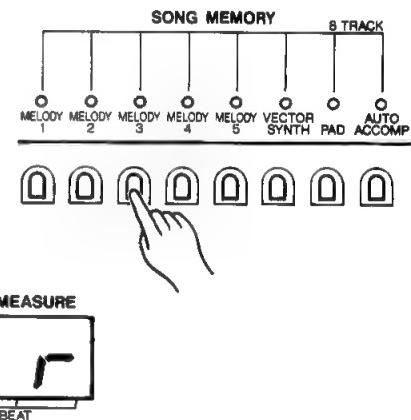
The recording feature of the PSS-51 allows tracks to be edited or completely changed without affecting any of the other tracks.

■ Clearing a Track

When clearing a track, make sure the indicator for the track to be cleared is on.

1. While holding down the [CLEAR] button, press the select button for the track to be cleared.

The [SONG#/MEASURE] display will show "c 1 r" (clear) and the track's indicator will go out. The entire track will be erased.

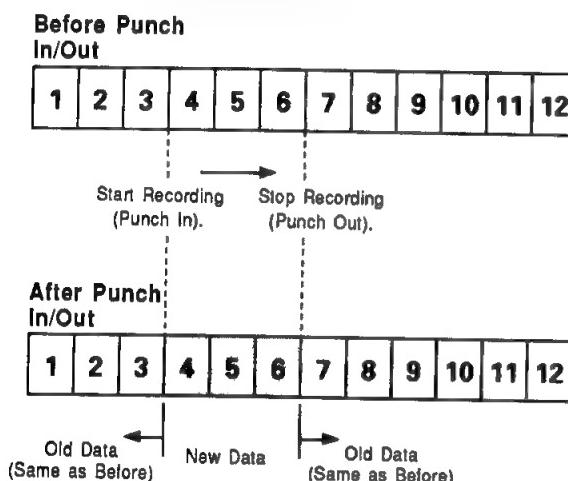


HINT: While holding down the [CLEAR] button, press the [STOP] button to clear every track from the current measure number to the ending measure simultaneously.

■ Editing a Track (Punch In/Out)

Punch In/Out is convenient for measure-by-measure track editing. This is especially helpful when there are only one or two mistakes to be changed in the recording. Only the desired measures need to be edited, not the whole track. The recorded data can be edited as often as required until a perfect recording is produced.

◆ Example: Re-recording measures 4 through 6 of a song.



1. Use the [REWIND] or [FAST FORWARD] buttons to locate the measure to be edited.
2. While holding down the [RECORD] button, press the appropriate track select button to record over the measures.
The corresponding track indicator will flash when the track is ready for editing.
3. Start re-recording.
While the track is being edited, the indicator will continue to flash. Tracks previously recorded will playback along with the new entry if the indicators for the tracks are lit.
4. Press the [STOP] button to finish editing.
The measure indicator will automatically return to the starting measure of the re-recording. This is useful for editing the same section repeatedly.
5. Press the [RESET] and [PLAY] buttons to hear the complete recording and to check the results.

● SONG MEMORY Track Information

It is easy to forget the settings used to make the recordings on the SONG MEMORY tracks. The PSS-51 has a convenient feature that allows you to recall the VOICE, VOICE EFFECT, and PAD data recorded on each track. Use the [KBD TRANSMIT CH] button to select the track and recall the recorded setting by pressing the corresponding button as explained below.

1. Select a Song Number.
2. Press the [KBD TRANSMIT CH] button.
3. Enter the MIDI channel number corresponding to the track number.
Refer to the "Relationship between SONG MEMORY tracks and MIDI channels" on page 41.
4. Press the VOICE, VOICE EFFECT, or PAD buttons.
If you want to know what VOICE was recorded on a particular track, press the [VOICE] button. The recorded VOICE number will appear on the MULTI DISPLAY.
5. Repeat steps [2] through [4] to recall the values of any other settings for the selected track.

EXAMPLE: SONG MEMORY (MULTI-TRACK RECORDING)

This section provides you with an example of how to use the SONG MEMORY to perform multi-track recording. The song to be played is the "POLOVETZIAN DANCE" from Act II of the Russian opera "Prince Igor". This song is by the Russian composer Aleksandr Borodin. The portion of the song used for this example is written on the score sheet page 36.

* If you wish to record a shorter (12 measure) example, skip measure numbers 5 through 20 (marked from A to B on the song sheet).

Track Recording Sequence

The following tracks will be recorded one at a time:

1. [AUTO ACCOMP.] track
2. [MELODY 1] track
3. [MELODY 2] track
4. [MELODY 3] track
5. [PAD] track

STYLE 07 (EURO BEAT 1) is suggested as the overall rhythm pattern on the [AUTO ACCOMP.] track. You can use VOICE 51 (BRASS ENSEMBLE 1), VOICE 37 (ORCHESTRA HIT), and VOICE 80 (BELL STRINGS) on the [MELODY] tracks. For the [PAD] track, a WHISTLE from PERCUSSION 8 (LATIN 2) will enrich the recording.

[1] Recording the [AUTO ACCOMP.] track

STYLE	07 (EURO BEAT 1)
TEMPO	$\text{J} = 120$ (For recording, a relatively slow tempo can be used. The tempo can be set as desired during playback.)
ACCOMP. VOL.	22
FINGERING	Fingered
ORCHESTRATION ...	Large
ACCOMPANIMENT	
CONTROL	Normal (BRIDGE Off)

1. Press the [INTRO] and [SYNCHRO START/STOP] buttons.

The corresponding indicators will be lit, and the SONG MEMORY will be in record stand-by mode.

2. Play a "C" chord in the ACCOMPANIMENT SECTION of the keyboard.

The INTRO pattern will begin and continue for 4 measures.

3. After the INTRO pattern, play the other chords as written.

(Refer to the song sheet on page 36 for the appropriate chording.)

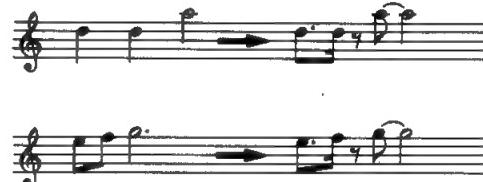
4. At the 12th measure, press the [FILL 2] button. The FILL 2 pattern will play and automatically change to the BRIDGE pattern.
5. At measure number 26, press the [ENDING] button.

[2] Recording the [MELODY 1] track.

VOICE:	51 (BRASS ENSEMBLE 1)
VOL.:	20

The melody for the song will be recorded on this track. While listening to the recording on the [AUTO ACCOMP.] track, play the melody. Wait until the four measures of the INTRO have completed before beginning to record the melody.

NOTE: As you become accustomed to playing this melody, you can make additions to enhance the recording. The following one measure examples suggest some possible changes or you can add your own.



[3] Recording the [MELODY 2] track.

VOICE:	37 (ORCHESTRA HIT)
VOL.:	20

Play the part written on the song sheet for the [MELODY 2] track.

[4] Recording the [MELODY 3] track.

VOICE:	80 (BELL STRINGS)
VOL.:	19

The [MELODY 3] track is the supporting (obligato) part of the song. Listen carefully to the melodies recorded on the [MELODY 1] and [MELODY 2] tracks, and play in unison to record the [MELODY 3] track. Concentrate in particular on the [MELODY 1] track to guide your playing.

[5] Recording the [PAD] track.

PERCUSSION:	8 (LATIN 2) PAD 8 (WHISTLE)
-------------------	-----------------------------

Strike the pads as you like during recording. The WHISTLE sound will play as long as the pad is being pressed. Try other PERCUSSION and SOUND EFFECT pads as well.

POLOVETZIAN DANCE

Aleksandr Borodin



$\text{♩} = 120$

1 [AUTO ACCOMP.] track



2 [MELODY 1] track

3 [MELODY 2] track

4 [MELODY 3] track

5 [PAD] track

A musical staff with five staves. The top staff is labeled "INTRO". The first staff starts with a C note. The second staff starts with an E note. The third staff starts with an E note. The fourth staff starts with a C note. The fifth staff starts with a C note. The staff ends with a box containing a circle and arrows pointing left and right, labeled "PERCUSSION PADS".

A musical staff with three staves. The first staff starts with a Dm chord. The second staff starts with a G7 chord. The third staff starts with a C chord. The staff ends with a box containing a circle and arrows pointing left and right, labeled "PERCUSSION PADS".

A musical staff with three staves. The first staff starts with a Dm chord. The second staff starts with a G7 chord. The third staff starts with an Am chord. The staff ends with a box containing a circle and arrows pointing left and right, labeled "PERCUSSION PADS".

2. OPERATION GUIDE

B Fm

Music score for section B in F major. It consists of three staves. The first staff has notes and a fermata. The second staff has a fermata. The third staff has a fermata and a melodic line.

Fm **Dm** **G7**

Music score for section Fm, Dm, G7. It consists of three staves. The first staff starts with a fermata. The second staff starts with a fermata. The third staff starts with a fermata. There are arrows pointing from the end of the G7 staff to a box labeled "FILL 2" and from the end of the third staff to a box labeled "PERCUSSION PADS".

A Dm **G7** **C**

Music score for section A in D major, followed by Dm, G7, and C. It consists of three staves. The first staff starts with a fermata. The second staff starts with a fermata. The third staff starts with a fermata.

Dm **G7** **ENDING** **C**

Music score for section Dm, G7, ending, and C. It consists of three staves. The first staff starts with a fermata. The second staff starts with a fermata. The third staff starts with a fermata. An arrow points from the end of the G7 staff to a box labeled "ENDING". An arrow points from the end of the third staff to a box labeled "PERCUSSION PADS".

2.6 SETTING OTHER FUNCTIONS

TRANSPOSE

Range: -24~24, Default: 0

-24~24
○
TRANS-
POSE



The TRANSPOSE feature makes it possible to shift the pitch of the PSS-51 up or down in semitone intervals from -24 to 24 semitones (24 semitones are two octaves). Transposition makes it easier to play difficult key signatures, and enables effortless matching of pitch to the range of a singer or another instrument.

1. Press the [TRANSPOSE] button.

The current amount of transposition will be displayed on the MULTI DISPLAY.

2. Increase or decrease the pitch.

Use the [+] button on the keypad to transpose the pitch upward and the [-] button to transpose the pitch downward. Holding down the appropriate [+] or [-] button will increase or decrease the pitch continuously.

If the TRANSPOSE value is changed, the default keyboard pitch value of "0" can be recalled by pressing the [+] and [-] buttons simultaneously.

* TRANSPOSE does not affect the PERCUSSION VOICES (numbers 68, 94 through 98).

* Adjusting the TRANSPOSE value will not affect any notes played at the time the value is set. Subsequent notes played will be transposed.

TUNING

Range: -16~16, Default: 0

-16~16
○
TUNING



The TUNING control makes it possible to adjust the standard pitch of the PSS-51 to match other instruments. Tuning can be adjusted up or down over a +/-16 step range (for a total of 32 steps or one semitone).

1. Press the [TUNING] button.

The current tuning value will be displayed on the MULTI DISPLAY.

2. Increase or decrease the standard pitch.

Use the [+] button on the keypad to tune the pitch upward one step and the [-] button to tune the pitch downward one step. Holding down the appropriate [+] or [-] button will increase or decrease the pitch continuously.

If the TUNING value is changed, the default standard pitch value of "0" can be recalled by pressing the [+] and [-] buttons simultaneously.

3. MIDI

The PSS-51 is equipped with MIDI to extend your musical possibilities. This section provides a brief introduction to MIDI and how to use its main features, and for reference, details about the transmit and receive information.

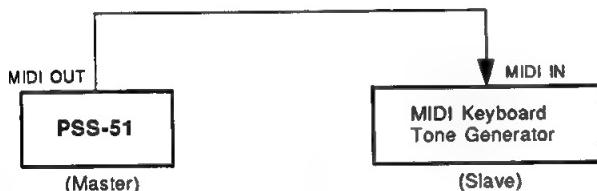
WHAT IS MIDI?

MIDI, the Musical Instrument Digital Interface, is a world-standard communication interface that allows MIDI-compatible musical instruments and equipment to share musical information and to control one another. MIDI capability makes it possible to create a system of MIDI instruments and equipment offering greater versatility and control than is available with the individual components.

■ USING MIDI

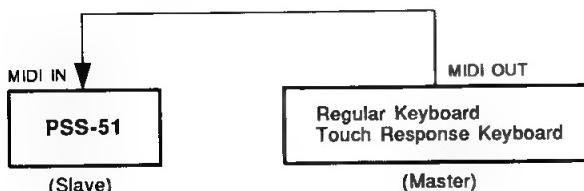
There are many ways to use and connect MIDI equipment. Other MIDI keyboards, sequencers, and computers can be connected. The examples below describe some of the more common MIDI systems, but there is really no limit as long as each piece of equipment has the MIDI interface.

- **Example 1**
Connecting the PSS-51 to a MIDI keyboard or a tone generator.



In this very simple connection, the PSS-51 (master) is set up to control a receiving device (slave) such as a keyboard or a tone generator. Playing the PSS-51 will generate sound from the slave device automatically. The sound generated from the slave will be combined with the sound from the PSS-51. The result is a richer sound with more variety.

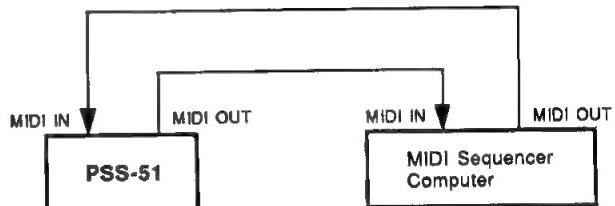
- **Example 2**
Connecting a regular or a touch response MIDI keyboard to the PSS-51.



In this example, the PSS-51 is the receiving device (slave) and is controlled by the transmitting keyboard (master). Sound is generated from the PSS-51. This type of connection is recommended if you like using a regular or touch response keyboard with the PSS-51 as the tone generator.

- **Example 3**

Connecting the PSS-51 to a sequencer or a computer.



This type of connection is useful for creating DTM (Desk Top Music) with a computer, or for making musical arrangements with a MIDI sequencer. The PSS-51 keyboard can be used to transmit actual hand-played data to a computer or sequencer in real-time. In addition, the PSS-51 can receive data from a computer or sequencer to generate multi-timbral performances. The data is received on 16 MIDI channels. Each channel can be turned ON or OFF and assigned with a particular sound.

■ MIDI MESSAGES

MIDI CHANNELS

MIDI uses 16 different channels to transfer digital messages from device to device. The transmitting device sends the messages for all 16 channels simultaneously. The receiving device is set to receive MIDI data for a single specified channel. It may be helpful to compare this to television broadcasting. From all the television channels broadcast, the channel that is received (and the program that is watched) depends on the channel selected. MIDI channels operate similarly; there are 16 channels and each channel contains a different message. Each channel is transmitted independently and the MIDI receiving instrument (slave) receives messages for a particular channel.

NOTE: The transmit channel number of the master must match the receive channel of the slave before messages can be communicated.

● Types of MIDI Messages

MIDI devices communicate channel messages and system messages. Channel messages carry performance information such as a channel number and specific data to control or produce sound. Channel messages include NOTE OFF, NOTE ON, PITCH BEND CHANGE, CONTROL CHANGE, and PROGRAM CHANGE. System messages apply to the entire MIDI system rather than a particular channel. System messages are typically used for synchronization purposes, controlling sequencers, resetting MIDI devices, and obtaining overall information. These messages include CLOCK, START, STOP, and ACTIVE SENSE. The sections below provide simple descriptions of these data as implemented in the PSS-51.

◆ NOTE ON/NOTE OFF

These messages are transmitted whenever a note is pressed or released. The data also includes the note and velocity for each channel.

◆ PITCH BEND CHANGE

This message indicates a change of pitch generated from the WHEEL function.

◆ CONTROL CHANGE

These are messages that contain information about MODULATION (VIBRATO), VOLUME, SUSTAIN, and REVERB characteristics.

◆ PROGRAM CHANGE

These messages concern VOICE changes. For the PSS-51, the VOICE number and the MIDI program number are the same. These numbers are not always the same for other instruments, however. When changing VOICE numbers, be sure to match the MIDI program number with the PSS-51 VOICE number. (Refer to the owner's manual of the connected MIDI devices for detailed program information.)

◆ CLOCK

CLOCK messages include data that can be used to synchronize the timing and tempo of MIDI instruments.

◆ START/STOP

These messages can be used to control the START/STOP of MIDI instruments. For the PSS-51, these messages apply to the SONG MEMORY function.

◆ ACTIVE SENSE

This message indicates that the MIDI device is no longer connected to the system. For example, if a cable is unplugged during a MIDI performance, the lack of a MIDI signal is detected and sound generation is stopped automatically.

■ MIDI CONNECTION

● MIDI Connectors

There are three MIDI connectors: MIDI IN, MIDI OUT, and MIDI THRU.



◆ MIDI IN

Receives data from another MIDI device.

◆ MIDI OUT

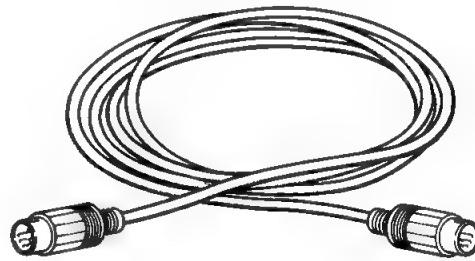
Sends MIDI data from the PSS-51 to another MIDI device.

◆ MIDI THRU

Sends out data received at the MIDI IN connector to another MIDI device.

● MIDI Cables

Use specialized MIDI cables to connect MIDI devices. To prevent data transmission errors, do not use cables that are more than 15 meters in length.



PSS-51 MIDI OPERATION

■ MIDI TRANSMIT MODE

Use the MIDI OUT connector for MIDI transmit mode.

Setting the Transmit Channel

Use the [KBD TRANSMIT CH] button to choose the PSS-51 transmit channel. Be sure to match the transmit channel with the receive channel on the other MIDI device.

1. Press the [KBD TRANSMIT CH] button.

The current MIDI transmit channel will be shown on the MULTI DISPLAY.

2. Refer to the MULTI DISPLAY and enter the transmit channel number.

Use the [+] or [-] buttons on the keypad to select the desired transmit channel.

* The transmit channel cannot be changed when the VECTOR SYNTH or the REGISTRATION MEMORY is on, when the SONG MEMORY is in record stand-by, or when the recording is in progress.

● SONG MEMORY TRANSMISSION

Recorded SONG MEMORY data can be sent to a receiving MIDI device. Refer to the chart below to match the transmit channels of the PSS-51 to the receive channels of another MIDI device.

• Relationship between SONG MEMORY tracks and MIDI channels

MIDI Channel	SONG MEMORY Track
1	
2	
3	
4	
5	MELODY 1
6	MELODY 2
7	MELODY 3
8	MELODY 4
9	MELODY 5
10	
11	
12	
13	
14	
15	
16	PAD

* The messages of the [VECTOR SYNTH] track are transmitted on channels 1 through 4. The messages includes data for the note played and the VOICE EFFECTS.

■ MIDI RECEIVE MODE

Use the PSS-51 MIDI IN connector to receive data from another MIDI instrument. The connected device can be used to control the PSS-51.

Setting the Receive Channel

Use the [RECEIVE CH/CLOCK] button to enable or disable PSS-51 receive channels. Data can be received when the channel is enabled. Be sure to match the PSS-51 receive channel number with the transmit channel number of the other MIDI device.

1. Press the [RECEIVE CH/CLOCK] button.

The right side of the MULTI DISPLAY will show the selected channel number. The left side will indicate whether the channel is enabled "E" or disabled "d".

2. Refer to the MULTI DISPLAY and enter the receive channel number.

Use the [+] or [-] buttons on the keypad to select the desired receive channel.

3. Press the [RECEIVE CH/CLOCK ON/OFF] button.

The left side of the MULTI DISPLAY will show the status of the channel:

"E" : Receive enable (ON) condition
"d" : Receive disable (OFF) condition

* By default, all channels (1~16) are initially enabled (ON) to receive data

Setting the CLOCK

An external MIDI device such as a sequencer can be used to control the start, the stop, or the tempo of a song recorded in the SONG MEMORY of the PSS-51. The CLOCK control can be selectively turned ON or OFF as desired.

* When the PSS-51 is in transmit mode, the CLOCK is always ON.

1. Press the [RECEIVE CH/CLOCK] button.

The right side of the MULTI DISPLAY will show the selected channel number. The left side will indicate whether the channel is enabled "E" or disabled "d".

2. Refer to the MULTI DISPLAY and enter the CLOCK control character.

Use the [+] or [-] buttons on the keypad to set the CLOCK control character "c". The character will

appear on the right side of the MULTI DISPLAY.

3. Press the [RECEIVE CH/CLOCK ON/OFF] button. The left side of the MULTI DISPLAY will show the status of the CLOCK control:

"E" : CLOCK receive enable (ON) condition
"d" : CLOCK receive disable (OFF) condition

* Start and stop of the AUTO ACCOMPANIMENT cannot be controlled by the external MIDI devices.

● Setting the VOICE for the Receive Channel

The [KBD TRANSMIT CH] button can also be used to set the VOICE for the selected receive channel. Press the [VOICE] button and set the desired VOICE number. The number of the desired channel is shown on the MULTI DISPLAY. The VOICE setting for each transmit channel will be the VOICE selected for the receive channel.

■ MEMORY BULK DUMP (Transmit and Receive)

The MEMORY BULK DUMP makes it possible to transfer all of the data in SONG MEMORY and REGISTRATION MEMORY. The data can be sent to any MIDI device with memory storage such as a sequencer, a personal computer or another PSS-51.

NOTE: The MEMORY BULK DUMP function can affect the contents of the SONG MEMORY and the REGISTRATION MEMORY of both the transmit and receive MIDI devices. Use the procedures described below after reviewing the channel information for both devices.

Transmit Operation

1. Press the [KBD TRANSMIT CH] button.
2. Press the [MEMORY BULK DUMP] button. The MULTI DISPLAY will indicate "b d p" (bulk dump). All PSS-51 sound will stop and the instrument will be in bulk dump stand-by mode.



3. Press the [MEMORY BULK DUMP] button again. Data transmission will start. The MULTI DISPLAY will countdown the current status from "b - 8" to "b - 0".



After about 50 seconds, the MEMORY BULK DUMP will finish, and the MULTI DISPLAY will indicate the current VOICE number.

- * During MEMORY BULK DUMP, the SONG MEMORY cannot be recorded or played back.

Receive Operation

There are no special operations required to receive bulk data. However, while receiving bulk data, the PSS-51 will stop generating sound. The MULTI DISPLAY will have the same indication as shown for the transmitting operation. When receiving is complete, the MULTI DISPLAY will indicate the current VOICE number.

NOTE: If problems occur while receiving bulk data, SONG MEMORY and REGISTRATION MEMORY will be completely erased, and the PSS-51 will return to its prior operating condition.

■ MIDI ERROR MESSAGES

The PSS-51 will generate an appropriate error message if problems occur during MIDI data transmission. You can then easily take steps to fix the problem. The following describe the error displays:

Display	Description of the Messages
bFu	♦ BUFFER FULL This error condition occurs when there is too much data sent to the PSS-51 during a data receive operation. The data buffer will overflow and the MULTI DISPLAY will indicate "b Fu". All sound generation will stop.
CFu	♦ CHANNEL FULL This message can occur during a data receive or transmit operation. Each MIDI channel (1~16) has a 28 note polyphony. If more than 28 notes are on a channel at one time, the MULTI DISPLAY will indicate "C Fu". The PSS-51 will continue to operate, but only notes within the polyphony limit will be transmitted or received. (Refer to the VOICE POLYPHONY list on page 46.)
Err	♦ CHECK SUM ERROR This error condition can occur while receiving a MEMORY BULK DUMP from another MIDI device. The MULTI DISPLAY will indicate "E rr". SONG MEMORY and REGISTRATION MEMORY will be completely erased, and the PSS-51 will return to its prior operating condition.

MIDI - TRANSMIT AND RECEIVE DATA FOR THE PSS-51

◆ Pitch Bend

The actual pitch bend data range is determined by the pitch bend range setting. If the pitch bend range is set to 12, for example, data from 00H 00H to 7FH 7FH will be transmitted. If the pitch bend range is set to 1, data from 3CH 3AH to 20H 45H will be transmitted.

◆ Program Change

The VOICE number and the MIDI program number are the same for the PSS-51. Refer to the VOICE number from the list on the front panel.

◆ Control Change

Data Format : BnH → cc → vv
 Bnh : Control Event (n=channel number)
 cc : Control Number
 vv : Control Value

cc=01H; modulation (vibrato)

VV =	00H - 0FH : 0 (off)
	10H - 1FH : 1 (min)
	20H - 2FH : 2
	30H - 3FH : 3
	40H - 4FH : 4
	50H - 5FH : 5
	60H - 6FH : 6
	70H - 7FH : 7 (max)

Each voice has its own default value that is used when the voice is initially selected.

cc=07H; volume

VV= 7FH : 24 (Panel Value; max)
01H : 01 (-24dB)
00H : 00 (no sound)

The default value when no data is being transmitted is 6F (panel value: 21)

cc=40H: sustain

VV= 00H - 3FH : 0 (off)
40H - 7FH : 1 (on)

ee-SRH: reverb

vv= 00H - 1FH : 0 (off)
 20H - 3FH : 1
 40H - 5FH : 2
 60H - 7EH : 3 (max)

Default is 0 (off).

■ BULK DATA FORMAT

● HEADER and EOX for Song Memory

11110000	Status = F0H
01000011	Manufacturer ID=43H (Yamaha)
01110110	Classification ID=76H (Portable Keyboard)
00001101	Data Format Number=0DH (PSS-51)

Song Memory Data (See next page)

11110111 EOX = F7H

● HEADER and EOX for Registration Memory

11110000	Status = F0H
01000011	Manufacturer ID=43H (Yamaha)
01110110	Classification ID=76H (Portable Keyboard)
00001110	Data Format Number=0EH (PSS-51)

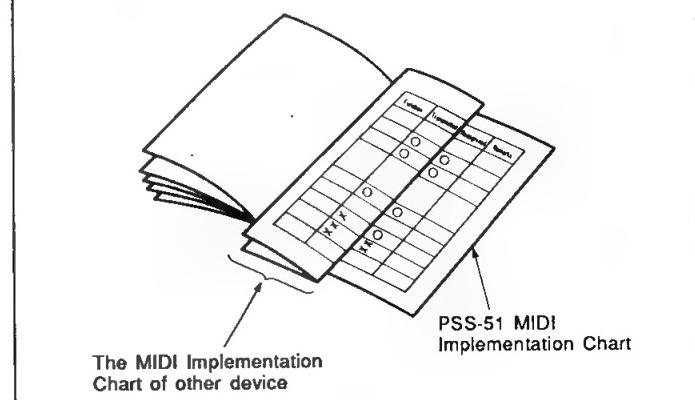
Registration Memory Data

Check Sum Data = Two's compliment of 7 bits sum of all Songs
EOX = F7H

● Reading the MIDI Implementation Chart

The MIDI Implementation Chart describes the different functions and conditions for transmit and receive MIDI data. The FUNCTION column describes the type of MIDI message. The TRANSMITTED column provides a reference for data transmission conditions. The RECOGNIZED column outlines the received data conditions.

HINT: To compare the MIDI Implementation Charts of connected devices, fold the respective charts lengthwise and match the columns. Refer to the diagrams below.



● BULK DATA

0000H	SONG HEADER
	song #1 DATA
	song #2 DATA
	song #3 DATA
	song #4 DATA
	song #5 DATA
	song #6 DATA
	song #7 DATA
	song #8 DATA
6b9FH	Registration memory data (400 bytes)

Bulk data consists of a Song Header and the data for 8 songs. The data size is fixed at 6bA0H bytes. The length of the Header is fixed as the first 16 bytes at the top of each song data. The data length of each song is variable. An unrecorded area (the area between Write Position Data and Read Position Data) exists somewhere in the data for the 8 songs, but only as long as the capacity for further recording remains. When the bulk data is dumped, this unrecorded area is located in the song selected using the PSS-51 panel controls. The position of this area in the song is also shown by the measure number. Once you upload the bulk data back onto the PSS-51 however, the position of the area will be reset to the top of the song.

0000H	Less significant byte (LSB)
0001H	Most significant byte (MSB)
0002H	LSB
0003H	MSB
0004H	LSB
0005H	MSB
0006H	Track status of song #1
0007H	Track status of song #2
0008H	Track status of song #3
0009H	Track status of song #4
000AH	Track status of song #5
000BH	Track status of song #6
000CH	Track status of song #7
000DH	Track status of song #8
0020H	Dummy Any data is OK. (2 bytes)

XXXXH	11110000
	00000001
	ABSOLUTE TEMPO
	ABSOLUTE TEMPO
	RECORDED DATA
yyyyH	
	UNRECORDED AREA Data has no meaning
	RECORDED DATA
zzzzH	11110010

11110000
Next Song Data (this case: for Song #2)

NOTE: The following data bytes are to be divided into 2 data segments.

- Address of Top of Record for selected song (XXXXH)
- Write Position Pointer (address of write position)(yyyyH)
- Read Position Pointer (address of read position)(zzzzH)

● Track Status:

bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
MELODY 1	MELODY 2	MELODY 3	MELODY 4	MELODY 5	VECTOR SYNTH	PAD	AUTO ACCOMP.
ch.5	ch.6	ch.7	ch.8	ch.9	ch.1-4	ch.16	-

status flag: 1=On, 0=Off

MIDI channels 1 to 16 respectively are assigned the corresponding tracks as shown above. In the case where Channel messages exist in the tracks MELODY 1 to 5, VECTOR SYNTH, and PAD, the status flags should be 1. In the case where chord data exist in the AUTO ACCOMP. track, its status flag should also be 1.

- Top of Record
- Song number (#) (this case: 1)

- Initial tempo of this song

- Write Position Data

- Read Position Data

- End of Record

● DATA CONTENT FOR EACH SONG

NOTE: Header and Footer information is always part of the song data content, even when the song data is empty.

◆ HEADER

11110000 Top of Record (TOR)
 00000nnn n=Song number (0-7)
 0ttttttt t=Tempo1 (40≤Tempo1≤127)
 0vvvvvvv t=Tempo2 (128≤Tempo2≤240)

◆ FOOTER

11110010 End of Record (EOR)

◆ INTERVAL DATA

0ttttttt t=Time length (01H:1/24 Beat, 18H: 1 Beat)

◆ PERFORMANCE DATA

- NOTE ON
 1001nnnn n=Channel no. (0-15)
 0kkkkkkk k=Note number (0-127)
 0vvvvvvv v=Velocity (0-127)
- NOTE OFF
 1000nnnn n=Channel no. (0-15)
 0kkkkkkk k=Note number (0-127)
 00000000 Velocity=fixed
- PROGRAM CHANGE
 1100nnnn n=Channel no. (0-15)
 0ppppppp p=Program number (0-127)
- CONTROL CHANGE
 1011nnnn n=Channel no. (0-15)
 0ccccccc *c=Control number
 0vvvvvvv *v=Control value
 - *c=Harmony (00)
 *v=Harmony type
 (0: OFF, 1: DUET, 2: TRIO, 3: BLOCK,
 4: COUNTRY, 5: OCTAVE, 6: STRUM,
 7: TREMOLO, 8-11: ECHO,
 12-15: HARMONY+ECHO)
 - *c=Modulation (01)
 *v=Depth (0-127)
 - *c=Volume (07)
 *v=Value (0-127)
 - *c=Sustain (64)
 *v=Depth (0-127)
 - *c=Reverb (91)
 *v=Depth (0-127)

◆ VECTOR SYNTH NOTE ON/OFF

11110011 Vector synth Note ON/OFF
 0vnnnnnn v=0 or 1 (0: Note OFF, 1: Note ON)
 n=Note number (0-63, 0: C1)

◆ VECTOR SYNTH VOLUME

11110100 Vector synth volume
 0vvvvvvv v=Ch.1 volume (0-127)
 0sssssss s=Ch.2 volume (0-127)
 0ttttttt t=Ch.3 volume (0-127)
 0uuuuuuu u=Ch.4 volume (0-127)

◆ CHORD CHANGE

11110101 Chord change
 0000rrrr r=Root name (0-11, 0:C, 1:C# ... 11:B)
 0000cccc c=Chord type
 (0: major, 1: minor, 2: 7th, 3: minor 7th,
 4: major 7th, 5: minor 7th flattened 5th,
 6: (7th) suspended 4th, 7: augmented (7th),
 8: diminished (7th), 9: minor major 7th,
 10: 7th flattened 5th, 11: minor 6th,
 12: perfect 5th, 13: Single (octave unison)

◆ MEASURE MARK

11111001 Measure mark
 0nnnnnnn n=number of beat in a measure
 (1 beat=1/4 note)
 0mmmmmm m=Measure number within a pattern

◆ STYLE NUMBER

11111010 Style number
 00000000
 00ssssss s=Style (0-79)
 00000vvv v=Variation
 (0: Normal, 1: Bridge, 2: Fill 1, 3: Fill 2,
 4: Intro, 5: Ending)

◆ RELATIVE TEMPO

11111011 Relative tempo
 0s00000n s=Sign bit (0: +, 1: -)
 0ddddd d=Tempo difference (0-127)
 Relative tempo=128*n+d

◆ ABSOLUTE TEMPO

11111100 Absolute tempo
 0ttttttt Tempo (40≤Tempo≤127)
 0vvvvvvv Tempo (128≤Tempo≤240)

◆ FILL IN STATUS

11111101 Fill in status
 0s00000n s=0 or 1 (0: OFF, 1: ON)
 n=Fill in number (0: Fill 1, 1: Fill 2)

◆ ORCHESTRATION

11111110 Orchestration
 000000tt t=Orchestration type
 (1: Large, 2: Medium, 3: Small)

APPENDICES

VOICE/POLYPHONY LIST

VOICE	POLYPHONY	VOICE	POLYPHONY	VOICE	POLYPHONY	VOICE	POLYPHONY
00 PIANO	1	25 JAZZ GUITAR OCTAVE	2	50 TUBA	1	75 SYNTH STRINGS	2
01 FLANGE PIANO	2	26 MUTE GUITAR	1	51 BRASS ENSEMBLE 1	3	76 SYNTH TOM	1
02 HONKY-TONK PIANO	2	27 MUTE GUITAR ECHO	2	52 BRASS ENSEMBLE 2	3	77 FANTASY 1	4
03 ELECTRIC PIANO 1	2	28 STEEL GUITAR	1	53 PICCOLO	1	78 FANTASY 2	2
04 ELECTRIC PIANO 2	2	29 FOLK GUITAR	1	54 FLUTE	1	79 FANTASY 3	4
05 ELECTRIC PIANO 3	2	30 12STRING GUITAR	2	55 CLARINET	1	80 BELL STRINGS	4
06 HARPSICHORD 1	1	31 GUT GUITAR	1	56 BASS CLARINET	1	81 SEQ PAD	3
07 HARPSICHORD 2	2	32 VIOLIN 1	1	57 OBOE	1	82 ELECTRIC BASS 1	1
08 CLAVI	1	33 VIOLIN 2	1	58 ENGLISH HORN	1	83 ELECTRIC BASS 2	1
09 CELESTA	1	34 CELLO	1	59 BASSOON	1	84 FRETLESS BASS	1
10 PIPE ORGAN 1	2	35 STRINGS 1	2	60 SOPRANO SAX	1	85 MUTE BASS	1
11 PIPE ORGAN 2	2	36 STRINGS 2	2	61 ALTO SAX	1	86 MUTE BASS ECHO	2
12 ELECTRONIC ORGAN 1	2	37 ORCHESTRA HIT	1	62 TENOR SAX	1	87 SLAP BASS	1
13 ELECTRONIC ORGAN 2	2	38 HARP	1	63 BARITONE SAX	1	88 WOOD BASS 1	1
14 ELECTRONIC ORGAN 3	2	39 BANJO	1	64 OCARINA	1	89 WOOD BASS 2	1
15 ELECTRONIC ORGAN 4	2	40 VIBraphone	2	65 PANFLUTE	1	90 SYNTH BASS 1	1
16 ACCORDION 1	2	41 MARIMBA	1	66 RECORDER	1	91 SYNTH BASS 2	1
17 ACCORDION 2	2	42 STEEL DRUM	1	67 HARMONICA	1	92 SYNTH BASS 3	1
18 ELECTRIC GUITAR 1	2	43 TRUMPET	1	68 SAMBA WHISTLE	1	93 BOWED BASS	1
19 ELECTRIC GUITAR 2	1	44 MUTE TRUMPET 1	2	69 SAX ENSEMBLE 1	2	94 SCRATCH W/PITCH	1
20 ELECTRIC GUITAR 3	1	45 MUTE TRUMPET 2	1	70 SAX ENSEMBLE 2	3	95 KICK&SNARE W/PITCH	1
21 TREMOLO GUITAR	1	46 MUTE TRUMPET 3	1	71 WOODWIND ENSEMBLE	3	96 TOM W/PITCH	1
22 ELECTRIC 12STRING GUITAR	2	47 TROMBONE	1	72 CHORUS	2	97 LATIN PERCS W/PITCH	1
23 DISTORTION GUITAR	2	48 FLUGELHORN	1	73 SYNTH LEAD	2	98 PERCUSSION W/GATE	1
24 JAZZ GUITAR	1	49 HORN	1	74 SYNTH BRASS	2	99 PERCUSSION	1

* The PSS-51 features a maximum polyphony of 28 notes. Some of the VOICES listed above are actually combinations of two or more notes. If more than 28 notes are played at any one time, the extra notes will not sound and "CFu" (channel full) will appear on the MULTI DISPLAY to indicate that the maximum polyphony has been exceeded. Refer to page 42 for an explanation of the CHANNEL FULL message.

SPECIFICATIONS

Keyboard	61 Mini keys (C1 to C6)	Overall Control	Tempo (40~240)/Transpose (-24~24)/ Tuning (-16~16)/Accomp. Vol. (0~24)/ Wheel (0~3)
Power	On/Off Switch	Auto Accompaniment	Single Finger/Fingered
Master Volume	Min-Max Slider	Fingering	Small/Medium/Large
Voces	100 preset AWM Voices; 28 Note Polyphony (00~99)	Orchestration	Intro, Fill1, Fill2, Bridge, Ending, Synchro
Styles	80 Rhythm Styles (00~79)	Accompaniment Control	Start/Stop, Start/Stop, Fade In/Out, Synchro Break
Demo	3 Songs; Start/Stop	Auxiliary Jacks	Headphones/Aux. Out, DC (9-12V) In
Vector Synthesizer	On/Off, Joystick	MIDI Jacks	MIDI In/Out/Thru
Numeric Keypad	0~9, +/-	Main Amplifiers	2.5W x 2 (when using AC power adaptor PA-3), 1.7W x 2 (when using batteries)
Registration Memory	Registration On/Off	Speakers	10cm (3-15/16") x 2 (8 ohms)
Multi Display	3-digit LED display	Rated Voltage	DC 9-12 V
Wheel	Up/Down	Batteries	Six SUM-2, "C" size, R-14 or equivalent batteries
Pad	Sound Effect (0~9)/Percussion (0~9)	AC Power Adaptors	PA-3, PA-4, PA-40
Song Memory Tracks	Melody [1]~[5], Vector Synth, Pad, Auto Accomp.	Dimensions	776mm x 301.4mm x 132mm (30-9/16" x 11-7/8" x 5-3/16")
Song Memory Buttons	Reset, Rewind, Stop, Play, Fast Forward	(W x D x H)	4.5kg (9lbs. 15oz) excluding batteries
MIDI	KBD Transmit Ch, Receive Ch/Clock On/Off	Weight	
Voice Effect	Volume (0~24)/Harmony (0~14)/Sustain (0~1)/ Reverb (0~3). Harmony On/Off		

* Specifications subject to change without notice.

TROUBLESHOOTING

APPENDICES

SYMPTOM	POSSIBLE CAUSES	SOLUTIONS
Speakers produce a "pop" sound whenever the POWER is turned ON or OFF.	Initial electric current flow.	Normal situation
No sound.	MASTER VOLUME is turned down.	Turn up the MASTER VOLUME.
	VOICE EFFECT volume is assigned too low or at "0".	Set the VOICE EFFECT VOL. higher.
	HEADPHONES/AUX. OUT terminal has a jack inserted.	Remove the jack.
Cannot change the VOICE or the rhythm STYLE.	The VOICE or STYLE button has not been pressed first.	Refer to pages 14, 18
Rhythm will not start or no rhythm sound.	The ACCOMP. VOL. is turned down.	Refer to page 19.
	The [START] button of AUTO ACCCOMPANIMENT is not pressed.	Refer to explanations on pages 20 to 24.
	After pressing the [SYNCHRO START/STOP] button, the appropriate key or keys have not been played.	
AUTO ACCCOMPANIMENT will not function.	You are in normal mode. (Both fingering modes are off.)	Assign the appropriate FINGERING mode to obtain AUTO ACCCOMPANIMENT.
Cannot turn ON the HARMONY function.	The VECTOR SYNTH is ON.	Turn OFF the VECTOR SYNTH.
Cannot play the desired chord while pressing the keys when using AUTO ACCCOMPANIMENT.	May be trying to play a FINGERED chord in the SINGLE FINGER mode, or vice versa.	Change the FINGERING mode or your fingering work.
Abnormal operation not listed above. Complete lack of control.	The internal microcomputer may have been affected by static electricity or other factors.	i) Turn the POWER OFF. ii) While holding the [SINGLE FINGER] and [FINGERED] buttons down at the same time, turn the POWER ON. This operation is called "All Reset", and returns the PSS-51 to "Factory" status. Remember, this operation will erase ALL the stored data.

INDEX

A

AC power	4
Accompaniment control	22
Accomp. vol.	19
Auto accompaniment	18
Auxiliary equipment	5

B

Batteries	4
Bridge	23

C

Clock	41
-------------	----

D

Demo	8
------------	---

E

Ending	23
--------------	----

F

Fade in/out	24
Fill 1	23
Fill 2	23
Fingered	21

H

Harmony	16
Headphones	5
Headphones/Aux. Out jack,	5

I

Intro	22
-------------	----

K

Keyboard percussion	14
---------------------------	----

M

Master volume control	8
Measure	33
Melody	30
Memory bulk dump	42
MIDI channel	39
clock	41
connectors	40
error messages	42
receive mode	41
transmit and receive data	43
transmit mode	41
Modulation	28

N

Normal	22
--------------	----

O

Orchestration	22
---------------------	----

P

Percussion	25
Pitch bend	28
Polyphony	42, 46
Power switch	8
Punch in/out	34

R

Receive channel	41
Recording example	35
preparation	31
procedure	30
tracks	30
Registration memory	25
Reverb	17

S

Single finger	20
Song editing	33
length	32
number	31
playback	33
Song memory	30
Song memory track information	34
Sound effect	26
Specifications	46
Start/stop	23
Style	18
Sustain	17
Synchro break	24
Synchro start/stop	22

T

Tempo	19, 28
Tempo & pitch	28
Track	30
Transmit channel	41
Transpose	38
Troubleshooting	47
Tuning	38

V

Vector Synth	27
Voice effect	16
Voice	14, 46
Vol.	16

W

Wheel	28
-------------	----

YAMAHA [PortaSound]
 Model PSS-51 MIDI Implementation Chart Version : 1.0

Date : 02/05, 1992
 Version : 1.0

Function ...	Transmitted Manual/Accomp/Rhythm	Recognized	Remarks	
Basic Channel Default Changed	1 /10-15/ 16 1-16	1-16 1-16(*1)		
Mode Default Messages Altered	3 x *****	3 x x		
Note Number : True voice	0-127(*7) *****	0-127 0-127		
Velocity Note ON Note OFF	x 9nH,v=1-127(*2) x 9nH,v=0	o 9nH,v=1-127 x 9nH,v=0,8nH		
After Touch Key's Ch's	x x	x x		
Pitch Bender	o	o	7bit resolution	
Control Change	1 07 10 40 91	o o o (*7) o o	o (*3) o o (*3) o (*3) o (*3)	VIBRATO SW VOLUME SW PAN SW SUSTAIN SW REVERB SW
Prog Change : True #	o, 0-99(*4) *****	o, 0-99(*5) 0-99		
System Exclusive	o	o		
System : Song Pos : Song Sel Common : Tune	x x x	x x x		
System : Clock Real Time : Commands	o o	o (*6) o		
Aux : Local ON/OFF : All Notes OFF Mes- : Active Sense sages:Reset	x x o x	x o o x		

Notes: *1: Possible to set ON/OFF individually on each channel (1-16ch).

*2: Manual: Value is fixed at 5AH when Keys are pressed.

Accomp: Various values are possible.

Playback: Recorded value in Song Memory.

*3: Not received by every VOICE selected.

*4: VOICE #0-#99 (Refer to VOICE list).

*5: Ignores the Message on Ch. 16.

*6: Possible to set ON/OFF manually.

*7: During DEMO and ACCOMPANIMENT, PAN control changes as well as Note Numbers 0 - 127 are transmitted.

Mode 1 : OMNI ON, POLY Mode 2 : OMNI ON, MONO
 Mode 3 : OMNI OFF, POLY Mode 4 : OMNI OFF, MONO

o : Yes
 x : No

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